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Practical Pharmacy Edition

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Editorial

WHAT *YOU* CAN DO TO HELP

ON DECEMBER 7th the enemies of freedom, democracy, and our "way of living" declared war on this country and attacked our Pacific possessions. At this writing 90 per cent of the population of the world in which we live is engaged in the hostilities.

This is a fight for our very existence as a free people, and every man and woman in the country is being called upon to pitch in and help. Perhaps the deciding factor between victory and defeat, our freedom or bondage, will be whether we as individuals in a democracy, working without compulsion, can effect a unity of purpose and effort that will surpass that of our enemies who are working under the whip of totalitarianism.

From now on we of the profession of pharmacy have no problem or objective except that of doing everything within our power to help this country win this war. Let's drop everything else.

What can you do to help?

CIVILIAN MORALE

This war will be won by the efforts of clear thinking, level-headed men and women who allow nothing to rob them of their efficiency and capacity to contribute time, thought, and energy to their jobs. War-jitters, fed by gossip and rumor, disrupt the civilian population and cut in half its productive ability. You can't do your best work if you are emotionally upset, mentally befuddled, and panicky.

The enemy knows this and wages a war of nerves as well as a war of actual combat. If the enemy can break down the civilian morale of the country by circulating rumors or even by token bombings, the war is half won. And, unfortunately, our democratic system in providing us with the freedom we love has given others the opportunity to capitalize on the opportunity to plant an abundant supply of fifth columnists in our midst to conduct the war from within. Their job is to start wild rumors designed to put fear into our hearts, spread gossip to upset our confidence in those who lead us, and create fantastic tales to make us panicky.

The war of nerves can be defeated if those in whom the public has confidence will "debunk" gossip and rumors and provide the reassurance necessary to stabilize their emotions. This is a task for you—the neighborhood pharmacist—in whose word the public has the greatest respect. You are the man to whom your community has looked for advice since the first day you opened your doors. You are the man who gets out of bed at 3:00 A.M. to fill prescriptions when illness strikes suddenly; the man who drove fifty miles to the city to get serum and an oxygen tent when a patient had pneumonia; the man who kept open twenty-four hours a day during the flu epidemic; the man who suspected appendicitis when Mr. Brown asked for a box of laxative pills for his stomach pains and got him promptly under the care of a surgeon who operated at once and saved his life; the man whose prescription files trace the history of the community.

The confidence of the public has always been the most important requisite of the successful practice of pharmacy. You have spent years developing this close relationship with your customers; now is the time to put it at the service of your country. A word from you will reassure the scores who enter your doors daily.

Those who lead the Army and Navy of this country have made it their life's work. They studied tactics and maneuvers when you were studying incompatibilities and structural formulas. They have spent years in training for just exactly the work they are doing now. Neither you nor anyone else in your community knows what American brains and skill have developed in equipment and methods for war. More than that, we won't know until the war is won exactly how it was done. Necessarily the Army and Navy must cloak their moves with the utmost secrecy, but don't misinterpret lack of information as lack of action. Discount any and all "inside stories" you hear—those who are in a position to know what is going on are not talking in confidence, or "off the record." When a customer tells you he has been told something "on good authority," don't start an argument but point out that from your knowledge of affairs it is impossible for any one to have such confidential information. Urge him not to believe it nor to spread stories which are unsubstantiated. You are justified in telling him that no one really comprehends the tremendous power and strength of this country's air, land, and sea forces.

Make it a point to read your newspaper and listen to your radio critically. Learn to differentiate from the stories which are "reported" or "unconfirmed," and those which are official and dependable. Let your customers realize that you are right up-to-the-minute on facts but that you put no weight on rumor.

Remember the "Men from Mars" broadcast a few years ago that had people panic-stricken, leaving their homes, driving through stop lights, and franctically seeking refuge from a fantastic invasion? It's funny now, but it wasn't the night it happened. Make "Remember the Men from Mars Broadcast" your key phrase in discounting unfounded rumors and in instilling confidence in your customers. You can be a pillar of strength in your community if you will serve your country in this manner.

CIVILIAN DEFENSE

The services, facilities and personnel of retail pharmacies should be utilized in the Civilian Defense program. There is going to be a need for civilian defense work whether or not there is an actual invasion or widespread bombing of this country. In the last war ammunition plants and defense supply factories were sabotaged with loss of life and the infliction of injuries to hundreds. We may expect sabotage again and on an even wider scale. You are members of one of the public health professions to whom humanity looks for aid in physical distress. Every pharmacist in the country must stand shoulder to shoulder with the physician and nurse in the relief of suffering and the saving of lives in the event of a catastrophe.

Elsewhere in this issue are the recommendations prepared by the U. S. Office of Civilian Defense for State Defense Councils outlining some of the more important services and facilities of pharmacies which may be utilized. It is up to your State Pharmaceutical Association to work out the details of the particular plan to be used in your State and it is up to you to put that plan in operation when it is developed.

CIVILIAN HEALTH

It is estimated that an average of one week's work is lost through illness by every working man each year. The total lost time due to illness of workers is enough to build fifty-two battleships—it is the equivalent of the full time work of a million men. Much of this illness is preventable if it can be nipped in the bud; if the individual would take greater pains to prevent illness and, if it does strike, will obtain competent medical care promptly before the disease gets the upper hand.

Here, again, the pharmacist is a key man. Through window displays, newspaper advertising and the distribution of public health literature, he can conduct a dynamic, effective, "keep well" program in his community. In his daily contacts with cus-

tomers he can preach the gospel of keeping well; of not taking a chance with a cold, a backache or persistent headaches; of not neglecting any minor ailment which might develop into a serious illness.

Most persons take their colds, their aches and their pains to the neighborhood pharmacist for advice first. Great has been the effort of pharmacists to convince the public that only a physician is competent to diagnose disease and that the pharmacist's job is the compounding and dispensing of medicines. However, the public's habits are not easily changed, and they still go to their neighborhood pharmacy for "something for a cold." Unwise self-medication, always discouraged by pharmacists, should now be strenuously opposed. Customers with colds, coughs and odd aches and pains which are often forerunners of serious conditions should be directed to physicians. It's the pharmacist's patriotic duty to help keep every man and woman mentally alert and physically fit for his job this winter.

Use "It's Patriotic to Be Healthy" as your theme for window displays, newspaper advertisements, and over-the-counter advice to your customers.

CONSERVE SUPPLIES

Pharmacists have experienced shortages of many drugs during the past year. Not only may this situation be expected to become more general and, in some cases, more acute, but commodities other than drugs may be at a premium. Wrapping paper, for example, will undoubtedly be increasingly hard to obtain. It is the part of wisdom to conserve as much as possible. Do not destroy cardboard displays and boxes for this material can be reprocessed and used again; sell or give it to the groups in your community who are collecting it. Do not waste corks, glass bottles, or other supplies. No one knows as yet just where the greatest shortages will occur, so don't waste anything.

Do not get upset over shortages of drugs. Some drugs, of course, are absolute necessities in that there is no satisfactory substitute for them, and these items are receiving first consideration by the governmental agencies of production management and civilian supply. Some drugs, although important, can be replaced by other drugs with similar action if it should become necessary. There are scores of drugs with anodyne action, laxative action, sedative action, etc., so it will be no great hardship if a few specific items in each class should become unobtainable. The Laboratory of the AMERICAN PHARMACEUTICAL ASSOCIATION at the AMERICAN INSTITUTE OF PHARMACY in Washington, D. C., is keeping in touch with the situation and it will recommend substitutions when and if they become necessary.

War, for years a possibility, is now a grim reality. It will be a happy day when once again our biggest problems will be how to discourage physicians from dispensing, how to label products under the Food, Drug and Cosmetic Act, and whether a visible prescription department is preferable to an entirely closed one. But these matters are of little significance in comparison with our real problem of to-day, that of pooling our hearts and hands to achieve a victory which will permit us to live as free men.

In a democracy such as ours you are asked, as individuals, to volunteer your services in bolstering civilian morale, in aiding civilian defense, in protecting civilian health, and in conserving supplies. Under a totalitarian government you would be ordered to do these things.

This war is a test of the democratic system against the totalitarian system. Can this country, depending upon your voluntary support, achieve the unity of effort of its citizens that the Nazi governments secure from its people by force? Will you as a pharmacist rise to meet the challenge? Whether or not you do, and the same applies to every other American citizen, will be a deciding factor in this fight for our very existence.

OCD ISSUES RECOMMENDATIONS TO PHARMACISTS IN CIVILIAN DEFENSE

YOUR COMMUNITY NEEDS YOU IN ITS PLANS FOR THE PROTECTION OF LIFE, VOLUNTEER YOUR SERVICES WITHOUT DELAY

As war struck the United States early in December, the necessity of developing practical, effective plans for the protection of civilian life and property became immediately apparent. Pharmacists were as ready as any, and better prepared than many, to assume their full share of responsibility in the task of rendering emergency aid and assistance to their communities. Weeks before war was actually declared the pharmacists of some states had developed specific plans with their Civilian Defense authorities to utilize the services, facilities, and personnel of their pharmacies in the work and other states had such plans in the process of development. All over the country pharmacists were taking first aid courses to bring their knowledge up-to-date.

In other states, Defense Councils had not yet begun to function and no specific plans had been developed for medical services, air raid warnings, volunteer police and fire squads or other community protection. Developments in the Pacific, however, stirred the country to move quickly and from all sections came reports of action.

As stated in the October issue of this JOURNAL, the actual development of Civilian Defense Plans is being undertaken by State Directors and the operation of such plans will be handled largely by individual cities, counties, and communities. These plans will vary somewhat dependent upon local conditions and needs.

Dr. George Baehr, Chief Medical Officer of the U. S. Office of Civilian Defense, prepared a list of eight general recommendations for State Defense Councils at work with state pharmaceutical associations on plans for the utilization of the services, facilities, and personnel of pharmacies.

Dr. Baehr stressed that space limitations and the large amounts of glass in pharmacies make them unsuitable sites in which to administer first aid.

The Medical Division of the Office of Civilian Defense has developed a basic plan for rendering medical services by physicians, nurses, and volunteer first aid workers. It is important that pharmacists do nothing that might confuse the public in regard to the procedure which has been worked out. Under the organized Emergency Medical Service hospitals are used as the basic unit. When an incident occurs, the Commander of the Control Center will direct the Emergency Medical Squads to man their designated Casualty Stations, and from these stations Emergency Medical Teams will go to the scene of the incident to set up First Aid Posts. The medical and nursing personnel of the First Aid Post examine injured persons, give emergency first aid treatment, and see that the most severely injured are given priority transportation back to the hospital. Slightly injured persons are sent back to the Casualty Station where they receive appropriate treatment and are kept under observation until they can be sent home or to places of temporary shelter.

It is important that the public understand that in an emergency the place to obtain first aid treatment is the official First Aid Post or Casualty Station, not the pharmacy. It is hoped that all pharmacists will become proficient in first aid procedures so that they can leave their pharmacies in charge of a competent employee while they go out as members of first aid squads operating between Casualty Stations, First Aid Posts, and the scene of the disaster.

In further emphasis of the important job of educating the public to go to First Aid Posts and Casualty Stations, Dr. Baehr recommends that pharmacies avoid the use of any Civilian Defense designation which would confuse the public concerning the location of these units.

Dr. Baehr's recommendations take cognizance of the important part the pharmacist can play in the Civilian Defense Program by making his pharmacy a center for the dissemination of authentic information to the public concerning the location and character of protection facilities in the neighborhood, shelters, wardens' posts, etc., and for the distribution of hand bills, booklets, etc., to instruct the public on what to do in an emergency.

He recommended that the pharmacy's stock of drugs, medicines, surgical, and sick room supplies be kept constantly replenished; that Chiefs of the Emergency Medical Services be kept aware of the available supplies in pharmacies; that the pharmacy's delivery trucks be registered for emergency transport; and that the pharmacy's telephone and refuge facilities be listed.

In every state, county, city, and community, pharmacists should volunteer their services to Civilian Defense in accordance with the plans developed by their State Defense Councils in coöperation with their state pharmaceutical associations.

TEXT OF DR. BAEHR'S RECOMMENDATIONS

December 15, 1941

MEDICAL DIVISION MEMORANDUM NO. 7

SUBJECT: Recommendation to Pharmacies by the Medical Division of the U. S. Office of Civilian Defense

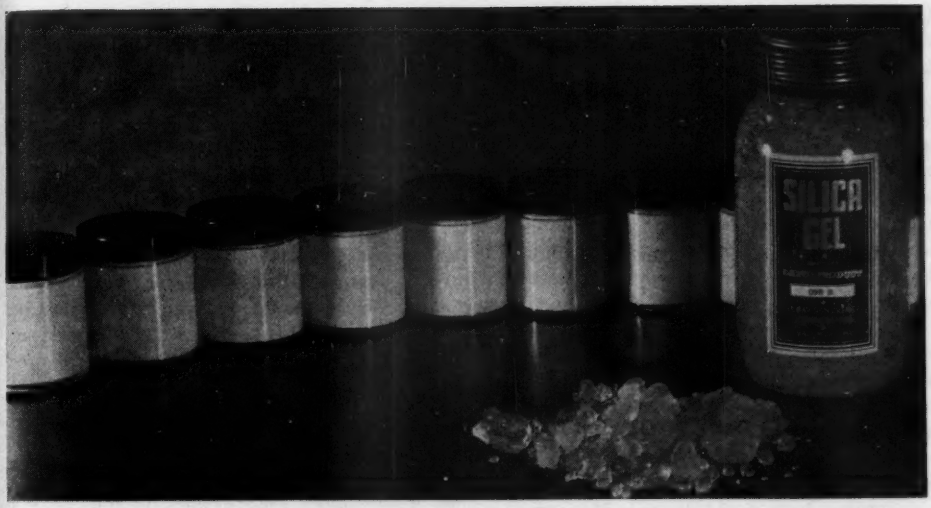
Large amounts of glass and space limitations make pharmacies unsuitable sites for Casualty Stations and First Aid Posts. Pharmacies are readily accessible in every community, are open during the greater part of the day and evening and are visited frequently by members of the community. They are admirable sites for the dissemination of information.

The stock of drugs, medicines, surgical, and sick room supplies available for purchase in every pharmacy should be kept constantly replenished.

What each pharmacist should do:

1. Register with the Chief of Emergency Medical Service in his community, indicating the supplies he has available.
2. If he has a delivery truck available for emergency transport, register it with the transport office of the local Defense Corps.
3. Register his pharmacy with his air raid warden, indicating the telephone and refuge facilities he has available.
4. Place his services at the disposal of the local defense council for distributing hand bills, displaying placards and other information on Civilian Defense.
5. Inform himself of the organization, location, and character of protection facilities in his neighborhood so that he can direct citizens to shelters, wardens' posts, casualty stations, and first aid posts.
6. Review and extend his own training in first aid and prepare himself to instruct others in his employ.
7. Large pharmacies should establish a First Aid Detachment among their employees which can be immediately available as a Stretcher Team to assist the Rescue Squads in the extrication of casualties from demolished buildings and transport them to the First Aid Posts of the Emergency Medical Service. For this purpose, it is advisable that pharmacies be equipped with a stretcher and with first aid supplies.
8. It is important that pharmacies avoid the use of any Civilian Defense designation which would tend to confuse the public concerning the location of Casualty Stations and First Aid Posts of the Emergency Medical Service. Injured persons should obtain care at official stations of the Emergency Medical Service or from their private physicians.

GEORGE BAEHR, M.D.,
Chief Medical Officer,
U. S. Office of Civilian Defense



THE USE OF HYDROGEL IN OINTMENT BASES

by WILLIAM A. PROUT and RHETT G. HARRIS

SCHOOL OF PHARMACY, MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA

SILICA GEL SEEMS TO ACT AS A SOLID EMULSIFIER IN PRESENCE OF WATER AND OLEAGINOUS SUBSTANCES. OINTMENTS OF 2% PHENOL AND 10% BORIC ACID IN SUCH BASES ARE ANTISEPTIC

THE employment of silica gel as an excipient for ointments (1) and also as an effective carrier for certain antiseptic medicaments (2) has been investigated and reported. Further studies have been carried out during the past year in an attempt to determine the manner in which such a substance as silica gel promotes the antisepticity of medicated ointments. It also appeared desirable to produce, if possible, an ointment base utilizing silica gel (Hydrogel*) which might prove practicable as well as acceptable from a pharmaceutical standpoint.

Presented before the Section of Practical Pharmacy, A. PH. A., Detroit meeting, 1941.

* Furnished through the courtesy of the Davidson Chemical Corporation, Baltimore, Md.

It has already been shown in this laboratory (3) and also by Reddish and Wales (4), Craw and Lee (5), Gershenfeld and Miller (6), and possibly others, that such antiseptic medicaments as phenol, boric acid, sulfur and zinc oxide, when incorporated in any of the ordinary oleaginous bases have failed to exhibit any bacteriostatic and bactericidal effects when tested by the Agar Cup-Plate Method (7), using *Staphylococcus aureus* as the test microörganism. It was for this reason, then, that these medicinal substances were chosen as the test agents in this investigation.

The problem resolved itself primarily into a study of the water-retention properties of ointments containing hydrogel. The role of water in ointments is an important one, as has been pointed out by Lesser (8). The incorporation of water in sufficient quantities into an oleaginous base necessitates either the formation of an emulsion by the use of emulsifiers or the "binding" of the water by the addition of a hydrophylic or a colloidal material. As emulsifiers, cholesterol (9) and its derivatives (10), various alcohols (11, 12), hydrogenated castor (13, 14, 15, 16), soybean and other oils (17), and triethanolamine

(12) have been employed. Minerals such as elkonite (18) and bentonite (19) have been utilized as "binding" substances.

"Hydrogel is a manufactured material obtained by the reaction of a soluble silicate, such as 'water glass,' and an acid, such as sulfuric; the two components being of definite ratio. The hydrosol of silicic acid thus formed 'sets' in a definite time to a hydrogel which is washed free from excess acid and salts." When incorporated in ointment bases, silica gel does not appear to act as a true colloid as do the mineral clays, elkonite and bentonite. Silica gel possesses the property to adsorb an unusually large amount of water to its surfaces, but, in itself, displays none of the characteristics commonly associated with substances which form gels when water is added, *viz.*, swelling, the forming of a jellylike mass, etc. It would appear much more probable that silica gel acts in an ointment base in the presence of water as a solid emulsifier.

In order to determine the approximate amount of water necessary in a hydrogel ointment base to produce an oil-in-water type base which, no doubt, favors the diffusion of water-miscible medicaments, conductivity experiments were carried out, utilizing the Van Dyk Emulsion Phase Tester (20). Varying amounts of hydrogel were added to a definite amount of white petrolatum until a minimum and a maximum conduction was obtained. The results of these experiments are tabulated in Table I.

CONDUCTIVITY EXPERIMENTS

TABLE I

White Petrolatum, Gm.	Hydrogel, Gm.	Per Cent Water	Conductivity
5.00	2.00	24.28	−
5.00	2.25	26.38	−
5.00	2.35	27.17	−
5.00	2.40	27.56	+−
5.00	2.50	28.33	+
5.00	2.85	30.85	+
5.00	3.00	31.87	++
5.00	3.02	31.93	++
5.00	3.04	32.13	++
5.00	3.06	32.27	+++[a]
5.00	3.08	32.40	+++
5.00	3.09	32.46	+++
5.00	3.10	32.53	+++

[a] +++ = Maximum conduction.

The minimum amount of hydrogel which may be added to 5 grams of white petrolatum in order to show any conductivity, thus indicating an oil-in-water type emulsion, was found to be approximately 2.5 grams. Maximum conductivity was obtained when approximately 3 grams of hydrogel were added to 5 grams of white petrolatum. There is a marked decrease in conductivity when hydrogel is incorporated in smaller quantities than the minimum amount mentioned above, namely, 2.5 grams, which appears to indicate a change in the oil-in-water phase.

Hydrogel and white petrolatum, however, do not make a very satisfactory ointment base from a pharmaceutical standpoint. On the basis of the calculated amount of water which must be present in order to show good conductivity, an ointment base was developed containing hydrogel, 36.85 Gm.; white wax, 5.00 Gm.; hydrous wool fat, 5.00 Gm.; and white petrolatum 53.15 Gm.

This base contained approximately 33 per cent water (21) but did not show the maximum conductivity. This may have been due to the presence of the white wax which may have exerted its effect as a "binding" agent. This base was also unsatisfactory from a pharmaceutical standpoint due to grittiness.

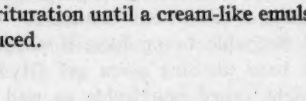
It was decided, then, to eliminate the white wax and also to increase the water content in order to produce a smooth ointment base and to increase the conductivity, which appeared desirable. As a result of these modifications, the following two distinct types of bases have been perfected:

HYDROGEL-PETROLATUM COMBINATION

BASE "A"

Hydrogel	45.00 Gm.
Hydrous Wool Fat	5.00 Gm.
Liquid Petrolatum	15.00 Gm.
White Petrolatum, *q. s.*	
To make	100.00 Gm.

Mix, in a mortar, the hydrous wool fat with the liquid petrolatum, and thoroughly levigate the hydrogel with this mixture. Finally add the white petrolatum and continue the trituration until a cream-like emulsion is produced.



HYDROGEL-HYDROGENATED VEGETABLE FAT COMBINATION

BASE "B"

Hydrogel	45.00 Gm.
Hydrous Wool Fat	5.00 Gm.
Liquid Petrolatum	15.00 Gm.
Hydrogenated Vegetable Fat, *q. s.*	
To make	100.00 Gm.

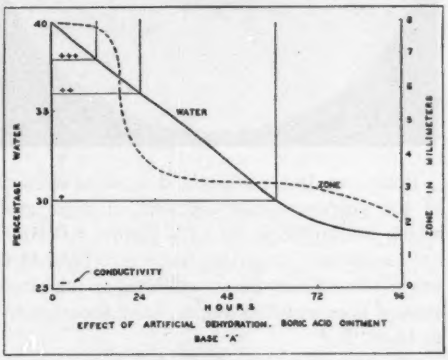
Mix, in a mortar, the hydrous wool fat with the liquid petrolatum, and thoroughly levigate the hydrogel with this mixture. Finally add the hydrogenated vegetable fat and continue the trituration until a cream-like emulsion is produced.

Base "A"—the Hydrogel-Petrolatum Combination, may be indicated for medicaments not intended for absorption, while base "B"—the Hydrogel-Hydrogenated Vegetable Fat Combination, may be employed for medicaments intended to be absorbed. Either base, when incorporated with any one of the commonly used medicinal substances, such as sulfur, phenol, zinc oxide, boric acid, red and yellow mercuric oxides, etc., presents excellent pharmaceutical preparations. It is often difficult, for instance, to produce an ointment of sulfur, with some of the ordinary bases, that is, free from some grittiness. Sulfur, when incorporated in either base "A" or in base "B," is levigated to a marked degree of smoothness. Yellow mercuric oxide in either of the bases shows no discoloration after having been stored in an ordinary container for an indefinite length of time. Zinc oxide, as in the case of sulfur, produces an unusually smooth preparation when incorporated in either of the bases.

Liquid petrolatum was chosen as the levigating agent in bases "A" and "B" because it was the only one of the six substances (2) which appeared to "hold" the water in the silica gel over a period of fifteen months' storage. Boric acid in base "E" (2) (silica gel and liquid petrolatum), at the end of the fifteen months' storage, was analyzed for its water content according to the Toluene Distillation Method of the Pharmacopœia (21). There was less than 1 per cent loss of water. This preparation was also examined for its antisepticity. At the end of the same period of storage, it exhibited practically the same zone of inhibition as it did when freshly prepared.

Bases "A" and "B" appear to lose little or no water of hydration upon standing for several weeks. It was demonstrated that only by means of artificial dehydration (desiccation) will any appreciable amount of water be lost from these bases within a reasonable length of time. As water is lost, however, there is a corresponding decrease in conductivity and in antisepticity.

The results of the effect of desiccation of ointment of boric acid (10%), when made with base "A" upon conductivity and upon antisepticity, are shown in Table II, and also in the accompanying graph. The water content was checked at the end of a definite period of desiccation according to the Toluene Distillation Method for the Determination of Moisture (21).



EFFECT OF ARTIFICIAL DEHYDRATION. BORIC ACID OINTMENT BASE "A"

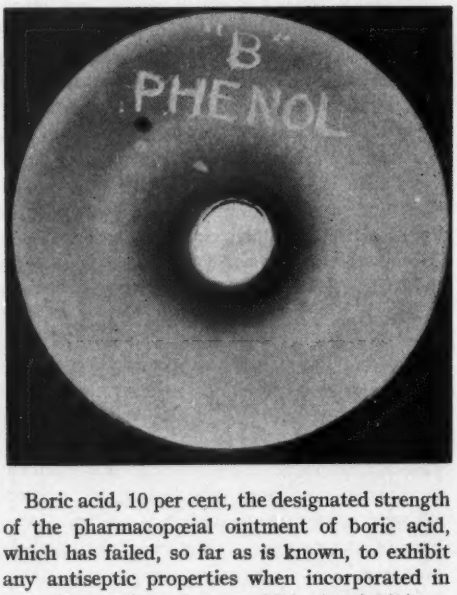
TABLE II.—EFFECT OF DESICCATION UPON OINTMENT OF BORIC ACID MADE WITH BASE "A"

Hours Desiccation	Per Cent Water	Conductivity	Zone of Inhibition, Mm.
0	39.75	+++	8
12	37.50	+++	7
24	36.00	++	6
36	34.00	+	3
48	32.00	+	3
60	30.00	+	2.5
72	29.00	+−	2.0
84	28.00	−	1.75
96	28.00	−	1.50

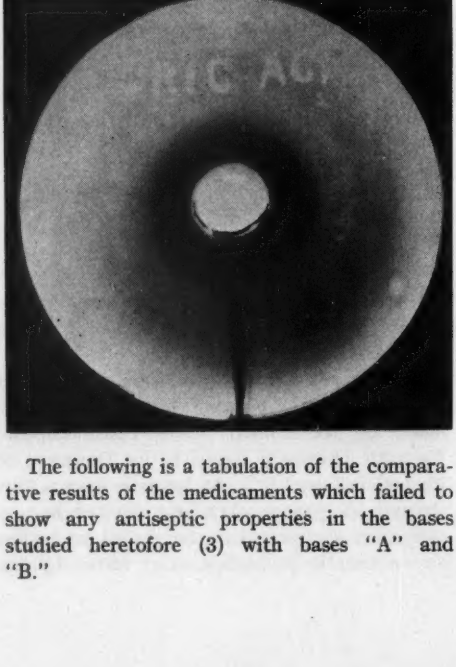
It is apparent that water plays a very definite role in the promotion of the diffusion of certain water-miscible medicaments.

Antisepticity experiments were carried out utilizing phenol, 2 per cent (the strength designated by the United States Pharmacopœia, Eleventh Decennial Revision, for Ointment of Phenol) in base "B." As far as is known, this strength of phenol when incorporated in any oleaginous ointment base has failed to exhibit any antiseptic properties when tested by the

Agar Cup-Plate Method (5, 7). It will be noted from the photograph that 2 per cent phenol incorporated in base "B" exhibited an approximately 4-mm. zone of inhibition.



Boric acid, 10 per cent, the designated strength of the pharmacopœial ointment of boric acid, which has failed, so far as is known, to exhibit any antiseptic properties when incorporated in any of the ordinary bases, exhibited an inhibitory zone of approximately 8 mm. when incorporated in base "B."



The following is a tabulation of the comparative results of the medicaments which failed to show any antiseptic properties in the bases studied heretofore (3) with bases "A" and "B."

BACTERICIDAL EFFICIENCY OF 2 PER CENT PHENOL OINTMENTS

Agar Cup-Plate Method

Bases	Inhibitory Zone in Mm., 3 Tests Each	Sub-Cultures Made from Center of Inhibitory Zone
U. S. P. X	0[a]	
U. S. P. XI	0	
Wool Fat	0	
Hydrous Wool Fat	0	
Petrolatum	0	
White Petrolatum	0	
Rose Water Ointment	0	
Protegin X	0	
Hydrogenated Fat	0	
Base "A"	6[a]	No growth
Base "B"	4[a]	No growth

[a] Average zone.

BACTERICIDAL EFFICIENCY OF 10 PER CENT BORIC ACID OINTMENTS

Agar Cup-Plate Method

Bases	Inhibitory Zone in Mm., 3 Tests Each	Sub-Cultures Made from Center of Inhibitory Zone
U. S. P. X	0	
U. S. P. XI	0	
Wool Fat	0	
Hydrous Wool Fat	0	
Petrolatum	0	
White Petrolatum	0	
Rose Water Ointment	0	
Protegin X	0	
Hydrogenated Fat	0	
Base "A"	7.6[a]	No growth
Base "B"	7.0[a]	No growth

[a] Average zone.

BACTERICIDAL EFFICIENCY OF 15 PER CENT SULFUR OINTMENTS

Agar Cup-Plate Method

Bases	Inhibitory Zone in Mm., 3 Tests	Sub-Cultures Made from Center of Inhibitory Zone
U. S. P. X	0	
U. S. P. XI	0	
Wool Fat	0	
Hydrous Wool Fat	0	
Petrolatum	0	
White Petrolatum	0	
Rose Water Ointment	0	
Protegin X	0	
Hydrogenated Fat	0	
Base "A"	2[a]	No growth
Base "B"	2.5	No growth

[a] Average zone.

BACTERICIDAL EFFICIENCY OF 20 PER CENT ZINC OXIDE OINTMENTS

Agar Cup-Plate Method

Bases	Inhibitory Zone in Mm., 3 Tests	Sub-Cultures Made from Center of Inhibitory Zone
U. S. P. X	0	
U. S. P. XI	0	
Wool Fat	0	
Hydrous Wool Fat	0	
Petrolatum	0	

White Petrolatum	0	
Rose Water Ointment	0	
Protegin X	0	
Hydrogenated Fat	0	
Base "A"	2.25[a]	No growth
Base "B"	3.00	No growth

[a] Average zone.

CONCLUSIONS

1. Hydrogel (silica gel) apparently acts as a solid emulsifier in the presence of water and oleaginous substances.

2. The minimum amount of water which, as calculated, must be present in a hydrogel ointment base is approximately 33 per cent.

3. As water is lost upon desiccation of an ointment made with a hydrogel base, there is a corresponding decrease in conductivity and in antisepticity.

4. Two ointment bases utilizing hydrogel-petrolatum and hydrogel-hydrogenated vegetable fat have been perfected.

5. Ointments of phenol, sulfur, boric acid, zinc oxide, red and yellow mercuric oxides, etc., when made with hydrogel-type bases present excellent pharmaceutical preparations.

6. Phenol, sulfur, zinc oxide and boric acid, respectively, when incorporated in a hydrogel-type base exhibit well-defined zones of inhibition. These medicaments have failed, heretofore, to show any antiseptic properties when incorporated with any of the oleaginous bases.

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(15) Fiero, G. W., "Hydrogenated Castor Oil in Ointments—Part 3. Product of Sulfonation," *Ibid.*, 28 (1939), 100.
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COUNCIL ON PHARMACEUTICAL EDUCATION TEN YEARS OLD

60 OF 68 COLLEGES WHICH APPLIED FOR ACCREDITATION HAVE BEEN APPROVED. FUNDS NEEDED FOR REINSPECTIONS. GIFTS TO COUNCIL EXEMPT FROM FEDERAL INCOME TAXES

IN 1942, which is just around the corner, the American Council on Pharmaceutical Education will have completed the first ten years of its existence. In these ten years, it has formulated standards for the accreditation of colleges of pharmacy, has perfected a working organization and has completed initial inspections of the sixty-eight colleges of pharmacy, which have applied for accreditation. Of this number of colleges, sixty have been accredited.

Up to the present time, funds for the operation of the Council have been provided through annual contributions of $200 each from the AMERICAN PHARMACEUTICAL ASSOCIATION, the National Association of Boards of Pharmacy, and the American Association of Colleges of Pharmacy. The cost of inspection has been defrayed entirely by the individual colleges. Present indications are, however, that the colleges will not be able to stand the expense of periodic reinspections. Some other means will have to be found to provide the funds for this purpose. It may be that it will be found necessary to invite contributions from outside sources. It is, therefore, encouraging, in this connection to be informed by the office of the Commissioner of Internal Revenue, Washington, D. C., that the Council is exempt from Federal income taxes and that it will not be necessary for the Council to file income returns. Furthermore, that contributions made to the Council are deductible by the donors in arriving at their taxable income; that bequests, legacies, devices and transfers, to or for the use of the Council, are deductible in arriving at the value of the net estate of a decedent for estate taxes and that gifts of property to the Council are deductible in computing net gifts for gift tax purposes.

SALES OF INDEPENDENT PHARMACIES

CENSUS OF BUSINESS (1939)

Sales Group	Number of Stores	Per Cent of Stores	Total Sales	Per Cent of Sales
$300,000 and over	37	0.07	21,109,000	1.82
100,000 to 299,999	576	1.03	80,597,000	6.93
50,000 to 99,999	3,232	6.01	210,309,000	18.09
30,000 to 49,999	7,506	14.00	281,161,000	24.19
20,000 to 29,999	9,055	16.84	221,944,000	19.09
10,000 to 19,999	17,614	32.75	260,326,000	22.41
10,000 or more	38,020	70.7	1,075,446,000	92.53
5,000 to 9,999	9,171	17.05	68,594,000	5.91
3,000 to 4,999	3,211	5.97	12,877,000	1.11
2,000 to 2,999	1,265	2.35	3,038,000	0.26
1,000 to 1,999	1,208	2.25	1,804,000	0.15
Less than 1,000	903	1.68	481,000	0.04
Less than $10,000	15,758	29.3	86,794,000	7.47
Total	53,778	100.	1,162,240,000	100.

NUMBER OF SUCCESSFUL PHARMACIES INCREASING

CENSUS OF BUSINESS SHOWS 5031 MORE PHARMACIES HAD ANNUAL SALES ABOVE $10,000 IN 1939 THAN DID IN 1935

THERE were 5031 more independent pharmacies with annual sales of $10,000 or better in 1939 than there were in 1935, according to the latest report of the Census of Business, issued by the United States Department of Commerce. The total number of independent pharmacies in the country increased only 736, from 53,042 to 53,778, during this four-year period, while total sales in independent drug stores increased $235,220,000—from $927,020,000 to $1,162,240,000—according to the report.

Thirty-eight thousand independent pharmacies do 92.53 per cent of the total drug business done by all independent drug stores in the United States. These 38,000 pharmacies which account for more than nine-tenths of all independent drug store sales are those with annual sales of $10,000 or more, and they represent 70.7 per cent of the total number of independent pharmacies in the country. The other 29.3 per cent of independent pharmacies together account for only 7.47 per cent of total independent drug store sales.

Annual sales of $10,000, or $27.40 a day, are generally considered to be the minimum for profitable operation of a retail pharmacy. On this basis the 15,758 drug stores which do less than this amount may be considered as unprofitable. For purposes of interpreting the Census figures it should be noted that a retail pharmacy with $15,000 annual sales is the approximate maximum for a one-man store without any help; sales of $15,000 to $20,000 can be handled by one man with part-time help; and sales of upward of $20,000 require the employment of two or more full-time pharmacists.

It is almost unbelievable that there are 903 independent pharmacies with annual sales of less than $1000 a year; their average sales being $533 per store, or about $10 a week. It is probable that in this group the Census includes new stores or stores which changed ownership during the

year and their figures represent sales for but part of a year.

In 1935 there were 32,989 independent pharmacies with annual sales of $10,000 or more, and they accounted for 88 per cent of independent drug store sales. In 1939, as stated before, there were 38,020 independent pharmacies doing $10,000 or more a year and they did 92.53 per cent of independent drug store sales.

The average sales per independent pharmacy in the United States in 1935 were $17,477; in 1939 they were $21,612.

A table with this article shows the number of independent pharmacies in each sales group included in the 1939 Census of Business, the per cent of stores in each group, the total sales of each group and the per cent of sales accounted for by each.

CHAIN STORES

The Census of Business report indicates that there are 4125 chain drug stores and they had total sales of $400,262,000. This means that 7 per cent of all the drug stores in the country are chain stores and they account for 25.6 per cent of total retail drug store sales.

N. F. VII WILL NOT CHANGE

BROWN AND STOKE'S FORMULAS

FAILURE OF CONGRESS TO AMEND FEDERAL ACT AND THE EFFORTS BEING MADE TO RETAIN EXEMPTION OF THESE TWO PREPARATIONS PERSUADES COMMITTEE TO MAKE NO CHANGES UNTIL THE MATTER IS SETTLED

THE Committee on National Formulary of the AMERICAN PHARMACEUTICAL ASSOCIATION has decided not to take the paregoric out of the formulas of Brown Mixture and Stoke's Expectorant in the forthcoming N. F. VII. Two factors influenced the Committee in arriving at this decision: (1) the fact that Congress has taken no action on Narcotic Commissioner Anslinger's request that the Harrison Narcotic Act be amended to limit exemption to preparations containing one grain or less of codeine per ounce, and (2) the current efforts of the AMERICAN PHARMACEUTICAL ASSOCIATION to have Commissioner Anslinger amend his request to retain Brown Mixture, Stoke's Expectorant and Lead and Opium Wash as exempt preparations.

Early this year Commissioner Anslinger asked the Governor of each State which had a Uniform Narcotic Law to secure the amendment of that law to limit exemption to codeine preparations on the grounds that narcotic addicts were purchasing paregoric to satisfy their cravings, and, furthermore, that this country's supply of opium should be conserved in the present emergency. A similar request was made of Congress for the amendment of the Harrison Act.

Because of this activity, the National Formulary Committee decided to revise the formulas for Brown Mixture and Stoke's Expectorant in order that they might be sold over the counter by retail pharmacists and the new, tentative formulas were announced several months ago.

During the August meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION at Detroit, a joint meeting was held between the Council of the A. PH. A. and the Executive Committee of the N. A. R. D. and it was decided to send a committee to Commissioner Anslinger in an effort to retain exempt status for Brown Mixture, Stoke's Expectorant, and Lead and Opium Wash. Commissioner Anslinger is at present making a survey of the sales of these three preparations.

In view of these efforts, the Committee on National Formulary decided to make no changes in the official formulas until the matter is settled.

In the meantime, pharmacists in those states which have amended their narcotic laws are in a difficult position for it is a violation of their narcotic laws to sell Brown Mixture or Stoke's Expectorant with paregoric and it is a violation of the Federal Food, Drug and Cosmetic Act to sell either preparation without paregoric.

NEWLY-DISCOVERED DIARY

SHATTERS LEGEND OF CINCHONA

PHARMACY'S FAVORITE STORY OF THE MIRACULOUS CURE OF THE COUNTESS OF CINCHON WITH THE NATIVE DRUG QUINA QUINA IS DISPROVED BY NEW EVIDENCE IN LONDON MUSEUM

FAMILIAR to all pharmacists is the classical story of the discovery of cinchona. Based on the writings of one Sebastiano Bado in 1663 who received his information from a merchant named Antonius Ballus, who lived many years in Peru, it is the story of the Countess of Cinchon, wife of the Viceroy of Peru, who fell ill of tertian fever. Physicians despaired of her recovery for their usual methods of treating the disease failed to halt the progress of the fever. The Spanish Governor of Loxa wrote the Count of Cinchon describing a drug known as *Quina Quina* which the natives used to treat tertian fever and, at the Count's request, he brought a supply to be administered to the Countess. She was promptly cured and when she returned to Spain she took a quantity of the drug and distributed it to the vassals of the Cinchon estate and to the poor of her native land. In honor of the Countess the drug was named cinchona and its active principle was later named quinine in recognition of the native name *Quina Quina*.

Later versions of the story varied the details a bit. One story claimed that the Count of Cinchon introduced the drug to Europe by sending a supply to the University of Alcala de Henares

Don Luis Geronimo Fernandez De Cabrera Y Bubadilla, Fourth Count of Cinchon, Viceroy of Peru 1628–1639, for whose wife cinchona was named.

Photo by courtesy of the Bulletin of the History of Medicine.

Map showing the habitats of Myroxylon and Cinchona as discussed in the writings of Espinosa and Cobo in the early 17th Century. Courtesy of the Bulletin of the History of Medicine.

where in 1639 it cured Dr. Michael de Barredo, professor of theology. Another story claimed that Dr. Juan de Vega, physician to the Countess, brought the drug to Europe, while still another story states that Dr. Michael Belga, physician to the Count's successor in Peru, brought it to Spain.

THE COUNT'S DIARY

In 1930 the diary of the Count of Cinchon relating to his term of office was discovered by a representative of Sir Henry Wellcome, of London, and since then it has been studied carefully by A. W. Haggis, of The Wellcome Historical Medical Museum. His findings, which contradict the popular legend, are published in the *Bulletin of the History of Medicine* for October and November 1941 (Vol. x, Nos. 3 and 4),* and may be summarized as follows:

1. The diary of the Count of Cinchon was kept in meticulous detail by his secretary, Don Antonio Suardo. It records the most trivial matters dealing with the daily life of the Count and Countess and yet it makes no mention of the Countess being ill with tertian fever at any time, nor does it describe the discovery of any new drug for the treatment of this disease. On the contrary, it records many attacks of malaria on the part of the Count and states that he was treated by being bled. Surely if a new, effective drug for this disease had been known it would have been administered to the Count.

2. The Countess of Cinchon couldn't have taken the drug back to Spain for she never returned to that country after she lived in Peru. She started back but died on the journey and was buried at Carthagena, Columbia, on January 14, 1641.

3. The Count did return to Spain and might have taken the drug with him, but he did not reach Spain until June 1641. The first European reference to the drug was in a book by Dr. Herman van der Heyden, published in 1643 and it is doubtful whether he would have become familiar with it in so short a time if the Count had introduced it.

4. Dr. Barreda was cured of malaria in 1639 so he is eliminated from the story on the basis of the dates alone.

5. Dr. Juan de Vega, physician to the Countess of Cinchon, never returned to Spain but stayed in Peru as professor of medicine in the University of Lima.

6. Dr. Michael Belga, physician to the Count of Cinchon's successor, did not return to Spain until 1650, so he couldn't have introduced the drug.

7. Not only is cinchona a misnomer for the drug, but so is quinine for its active principle for *Quina Quina* was the native name for Myroxylon, from which Balsam of Peru is obtained.

Who, then, did introduce cinchona into Europe? There is no complete solution, according to Historian Haggis. The drug was mentioned in a book by Antonio de la Calancha, published in Peru in 1633, and Mr. Haggis calls attention to the fact that there was a vast trade in new medicinal substances from America during this time. He doubts that eight years would elapse before the drug would be sent to Europe and believes that it was introduced soon after 1633 through the ordinary channels of trade or through members of the Society of Jesus who journeyed between the Old World and the New. The fact that the earliest European conference to the drug appears in a Belgian book suggests the possibility that it reached that country first rather than Spain.

So; apparently, ends one of pharmacy's most popular legends.

* The Johns Hopkins Press, Baltimore, Md.

N. F. ADDITIONS AND DELETIONS

NEW EDITION LOSES 33 ITEMS TO U. S. P. XII, DELETES 10 MONOGRAPHS, ADMITS 71 OUT OF 86 ITEMS DROPPED BY THE U. S. P. AND RECOGNIZES 25 NEW DRUGS AND PREPARATIONS

NINETY-SIX drugs and preparations have been added to N. F. VII, to be published early in 1942, according to Dr. Justin L. Powers, of Washington, D. C., Chairman of the Committee on National Formulary of the AMERICAN PHARMACEUTICAL ASSOCIATION. Of this number, 71 are articles that were official in U. S. P. XI but which the Sub-Committee on Scope decided not to include in the forthcoming U. S. P. XII. The N. F. Committee bases its decision on the admission of items dropped by the U. S. P. largely on the extent of use of the preparations and 15 items deleted from U. S. P. XI were not admitted to N. F. VII.

Forty-three items, official in N. F. VI, were not admitted to N. F. VII; 33 of them because the Sub-Committee on Scope of the U. S. P. admitted them to U. S. P. XII and the N. F. does not wish to publish duplicate standards, and 10 because they are believed to no longer enjoy an extent of use which would justify retaining them in the N. F.

A detailed breakdown of N. F. VII additions and deletions is as follows:

NEW ARTICLES ADMITTED

Ammoniacal Solution of Silver Nitrate

A widely used preparation in dentistry.

Cherry Juice

An ingredient of Syrup of Cherry.

Chloroformic Solution of Coal Tar

A superior preparation for the application of coal tar.

Compound Elixir of Benzaldehyde

For use as a flavoring agent in place of Compound Elixir of Bitter Almond.

Compound Syrup of White Pine with Codeine

Replaces Compound Syrup of White Pine with Morphine.

Magma of Bentonite

A 5 per cent aqueous suspension of Bentonite for extemporaneous use.

Merbromin
Merbromin, Solution of
Merbromin, Surgical Solution of

Preparations of the disodium salt of 2,7-dibrom-4-hydroxymercurifluorescein, originally introduced by Hynson, Westcott and Dunning under the proprietary name "Mercurochrome."

Methyl Parahydroxybenzoate

A preservative for use in preparations for external application.

Neocalamine
Neocalamine, Lotion of
Neocalamine, Ointment of
Neocalamine, Phenolated Lotion of

Preparations of a new form of calamine which more nearly approximate flesh color. The lotions contain Bentonite as a suspending agent.

Pectin
Pectin Paste
Pectin Paste, Thin

Preparations developed by the late Dr. Bernard Fantus for the pectin therapy of indolent ulcers, bed sores, etc.

Phenothiazine

A new anthelmintic for veterinary use.

Raspberry Juice

An ingredient of Syrup of Raspberry.

Red Ferric Oxide

Used in the preparation of Neocalamine.

Resorcinol Brown
Resorcinol Brown, Solution of

A coloring agent for pharmaceutical preparations, particularly Solution of Cinchona Alkaloids.

Spirit of Benzaldehyde

For use as a flavoring agent in place of Spirit of Bitter Almond.

Yellow Ferric Oxide

Used in the preparation of Neocalamine.

Zinc Eugenol Cement

A widely used preparation in dentistry.

ARTICLES DROPPED BY U. S. P. XII AND ADMITTED TO N. F. VII

Acetum Scillæ
Acidum Aceticum Dilutum
Aconitum
Acriflavina
Acriflavinæ Hydrochloridum
Aethylhydrocupreinæ Hydrochloridum
Ammonii Bromidum
Ammonii Salicylas
Arseni Triiodidum
Asafœtida
Bismuthi Subgallas
Calcii Creosotas
Cantharis
Capsicum
Carbromalum
Ceratum Cantharidis
Cinchona
Copaiba
Creosoti Carbonas
Creosotum
Dichloramina-T
Elixir Glycyrrhizæ
Emplastrum Cantharidis
Extractum Nucis Vomicæ
Ferrum
Fluidextractum Belladonnæ Radicis
Guaiacol
Hydrargyri Iodidum Flavum
Iodoform
Kino
Liquor Ammonii Acetatis
Liquor Ferri Chloridi
Liquor Ferri Tersulfatis
Liquor Sodii Hypochloritis Dilutus
Massa Hydrargyri
Mistura Opii et Glycyrrhizæ Composita
Oleum Santali
Paraffinum
Paraffinum Chlorinatum
Pepsinum
Pilulae Aloes
Podophyllum
Potassii Chloras
Pulvis Ipecacuanhæ et Opii
Pulvis Sennæ Compositus
Pyrogallol
Quinina
Resina Podophyli
Santoninum
Scillæ
Serpentaria
Sodii Acetas
Spiritus Aethylis Nitritis
Spiritus Benzaldehydi
Spiritus Chloroformi
Strychninae Nitras
Sulfonethylmethanum
Sulfur Lotum
Syrupus Ferri Iodidi
Syrupus Scillæ
Theobromina cum Sodii Salicylate
Tinctura Aconiti
Tinctura Cantharidis
Tinctura Capsici
Tinctura Cinchonæ Composita
Tinctura Ferri Chloridi
Tinctura Kino
Tinctura Scillæ
Tinctura Valerianæ
Tinctura Veratri Viridis
Valeriana
Veratrum Viride

ARTICLES OFFICIAL IN N. F. VI BUT ADMITTED TO U. S. P. XII AND THEREFORE NOT ADMITTED TO N. F. VII

Aethylis Carbamas
Amaranthum
Ampullæ Bismuthi Subsalicylatis
Ampullæ Caffeinæ cum Sodii Benzoate
Ampullæ Calcii Gluconatis
Ampullæ Dextrosi
Ampullæ Emetinæ Hydrochloridi
Ampullæ Epinephrinæ Hydrochloridi
Ampullæ Hydrargyri Salicylatis
Ampullæ Pituitarii Posterioris
Ampullæ Quininæ Hydrochloridi et Aethylis Carbamatis
Ampullæ Sodii Chloridi
Ampullæ Sodii Citratis
Calcii Phosphas Præcipitatus
Elixir Phenobarbitali
Liquor Amaranthi
Liquor Dextrosi et Sodii Chloridi Isotonicus
Methylrosanilinum
Potassii Chloridum
Quininæ Hydrochloridum
Syrupus Glycyrrhizæ
Tabellæ Acetophenetidini
Tabellæ Acidi Acetylsalicylici
Tabellæ Atropinæ Sulfatis
Tabellæ Barbitali
Tabellæ Barbitali Solubilis
Tabellæ Codeinæ Phosphatis
Tabellæ Morphinæ Sulfatis
Tabellæ Phenobarbitali
Tabellæ Sodii Nitritis
Tabellæ Sodii Salicylatis
Tabellæ Strychninæ Sulfatis
Tetrachloroethylenum

ARTICLES OFFICIAL IN N. F. VI BUT NOT ADMITTED TO N. F. VII

Cascara Amarga
Curatio Paraffini
Elixir Amygdalæ Compositum
Elixir Aquosum
Elixir Chloralis et Potassii Bromidi Compositum
Fluidextractum Trifolii Compositum
Prunus Cerasus
Rubus Idæus
Spiritus Amygdalæ Amaræ
Syrupus Trifolii Compositus

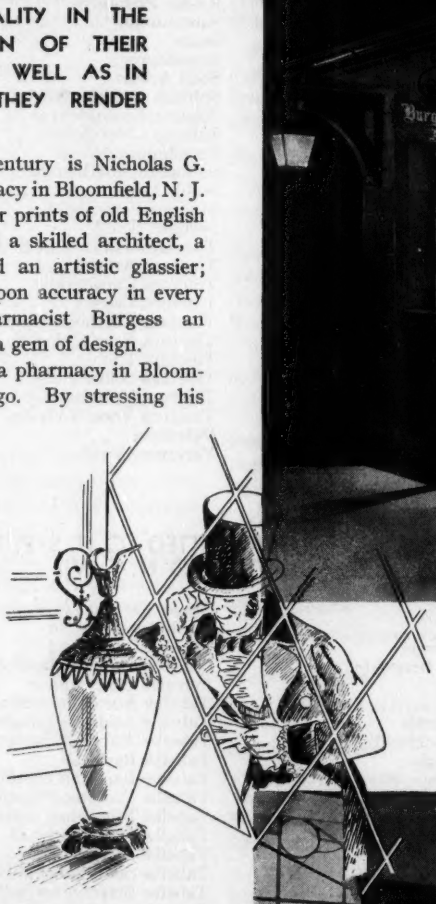
Hundreds of prints of Seventeenth Century English Buildings were studied to develop the design of this interesting New Jersey shop.

A MODERN
Old Fashioned Pharmacy

WHAT PHARMACIST BURGESS HAS DONE MORE PHARMACISTS SHOULD DO—REFLECT THEIR OWN INDIVIDUALITY IN THE PHYSICAL DESIGN OF THEIR PHARMACIES AS WELL AS IN THE SERVICES THEY RENDER

AUTHENTIC 17th Century is Nicholas G. Burgess' new pharmacy in Bloomfield, N. J. Hours of library search for prints of old English buildings; the services of a skilled architect, a capable stone mason and an artistic glassier; plus his own insistence upon accuracy in every detail, have given Pharmacist Burgess an apothecary shop which is a gem of design.

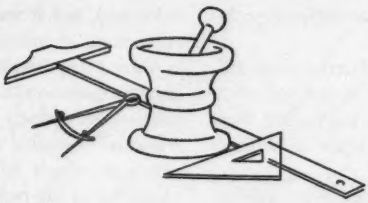
Mr. Burgess purchased a pharmacy in Bloomfield some eight years ago. By stressing his prescription department and professional services he gradually developed the store as a real pharmaceutical institution. This development, however, made it increasingly necessary to change the appearance of the pharmacy in order that it might reflect its true professional character.



Above: View of the impressive doorway of Mr. Burgess' shop in Bloomfield, N. J.

Not to be rushed into re-modeling, Mr. Burgess devoted months to formulating his ideas and plans. For many years he had been interested in the historical background of the profession of pharmacy and he liked particularly the design of early English apothecary shops. The substantial exteriors of rough-hewn timber and stone, the leaded glass windows, the slate roofs, and the oak-paneled interiors represented his idea of the finest in early store design. Naturally, then, his thoughts

centered around architecture of this period as the plans for his own pharmacy began to take shape in his mind.



When he had decided definitely that his pharmacy was to be of Seventeenth Century design, he called in a local architect, Raymond B. Flatt. Together they discussed the idea and made preliminary decisions as to space allotments and then sought the coöperation of the Bloomfield and Glen Ridge libraries in a search for old prints of English buildings.

It took months of research to collect the group of several hundred prints which were used to develop the design. Mr. Burgess insisted that the entire design be authentic and slowly he and Mr. Flatt put the pharmacy together bit by bit on the drawing board. The design was built up, torn down, re-worked, and revised until finally it met with their complete satisfaction.

Then began the task of obtaining the materials needed to construct the shop. From a stone mason they obtained a collection of old stone which has been brought from England as ship ballast. The stones were selected carefully and each was cut individually so as not to disturb the original face which showed the markings of the original craftsmen's tools. They were fitted together with care to make the piers which would support the store front. From a furniture-maker they obtained hand-hewn English oak with which to frame the windows. Over the entire front of the store they hung a narrow English stone roof in variegated colors.

An artistic glassier was called in to do the leaded glass front windows. His talent was clearly demonstrated in the mortar and pestle which he worked into the glass panel for the door and in the pair of caducei which he worked into a small side window. Much of the glass which he used actually came from old English buildings.

The front section of the interior of the pharmacy was made into a waiting room with a counter extending across the back. This section of the pharmacy was wainscoated in English oak paneling, finished in Verdi-antique stain and hand-polished with wax. The floor is covered with broadloom carpeting in the same restful light blue-green shade. For ceiling light fixtures Mr. Flatt obtained two beautiful crystal chandeliers.

Behind the waiting counter is a leaded glass backscreen obtained from an old New Jersey mansion and from the same source Mr. Flatt purchased the brass-studded leather door through which one enters the prescription room from the waiting room. A small glass case on one wall of the waiting room is used for the display of sick room supplies. Chairs and magazines are avail-

Below: Two views of the waiting room of the shop. It is finished in a light blue-green color which gives a very restful, professional atmosphere to the shop.

able for customers who wait for their prescriptions to be compounded.

In the front windows of the pharmacy are two beautiful showglobes with brass bases and ornamental tops. They were purchased by Mr. Burgess from the collection of antiques of William Randolph Hearst.

Although the exterior of the pharmacy and the waiting room are Seventeenth Century, the prescription room is most modern, for individual compounding desks permit pharmacists to work with the greatest efficiency and fluorescent lighting provides an abundance of light that makes the whole department gleam through the leaded glass backscreen which separates it from the waiting room. When completed the prescription room will have all white fixtures.

Remodeling his pharmacy meant rebuilding the entire front of the section of the building in which Mr. Burgess' store is located, but it was worth it. Comments from customers, of course, have been numerous for it is almost impossible to step in its door without giving expression to the quiet, restful professional atmosphere which permeates the shop. Mr. Burgess' objective was to give his shop an appearance which would reflect the professional character of his practice. He has done that and more, for since he remodeled the pharmacy the number of prescriptions he fills is rapidly increasing.

What Mr. Burgess has done in a small New Jersey town is something that pharmacists should do—stress their individuality in the design, layout, arrangement and appeal of their pharmacies. For too long all pharmacies have followed the same general pattern and looked about alike to the public.

Below: View of the prescription compounding room which is most modern in contrast to the rest of the shop.

Druggists' Digest

OF NEW FORMULAS, RECENT PHARMACEUTICAL DEVELOPMENTS, AND OTHER PROFESSIONAL DATA

ZINC PEROXIDE IN ATHLETE'S FOOT

Although potassium permanganate is one of the most effective drugs in the treatment of the acute stages of athlete's foot infections, it has the disadvantages of being unstable and being impossible of combination in an ointment or drying lotion. When the acuteness of the lesions has subsided, the blebs have broken, and the skin is mascerated and exuding, the use of irritating ointments and greases is inadvisable, if not actually contraindicated, and yet patients are not always willing or able to stay away from their occupations to use foot soaks or wet compresses.

Dr. Samuel Feldman, of New York City, states that zinc peroxide in vanishing cream is well suited for use in this situation. He has used such an ointment on 30 patients in Morrisania Hospital with gratifying results. Itching was relieved in a short time and the mascerated and exuding lesions became dry and clean looking within a few days and healed in a few weeks. The ointment is not greasy and does not soil footwear or bedclothes. It is particularly valuable in the treatment of lesions between the fingers and toes.

Dr. Feldman uses a Zinc Superoxide,* which consists of 45 per cent of zinc peroxide (ZnO_2) and 55 per cent of zinc oxide (ZnO), with an oxygen content of 7.4 per cent. It is more stable than zinc peroxide (Z.P.O. Merck) which is used for autoclaving. In combination with moisture, even the amount in a vanishing cream base, oxygen is liberated but not in sufficient quantity to interfere with the therapeutic activity. For the vanishing cream base, Dr. Feldman uses the following formula:

Stearic Acid, U. S. P.	20.0
Glycerin	3.4
Potassium Hydroxide	1.8
Water	80.0

* Merck and Company.

Dr. Feldman prescribes a 10 per cent ointment of Zinc Superoxide in this base.

The ointment is fairly stable when kept in a cool place in a jar with a non-metallic cap. Space in the jar should be allowed for the accidental accumulation of oxygen.

—*Arch. Derm. & Syphil., 44:4 (Oct. 1941), 674*

PHENOTHIAZINE IN THE TREATMENT OF ENTEROBIASIS

Eighty-nine children and 9 adults infected with pinworms were treated with phenothiazine with cures in all cases except one, according to Dr. E. Kuitunen-Ekbaum, of the Department of Hygiene and Preventive Medicine, of the University of Toronto. Phenothiazine is at present being used in the United States as a veterinary anthelmintic and, as such, has been admitted to the National Formulary VII, but it has not been released for human use.

A recrystallized phenothiazine was used in the Canadian study. The following dosage table was used:

For children of 2 to 5 years, a total of 4–5 Gm. in divided doses over a period of 5 to 6 days.

For children of 6 to 8 years, a total of 6 Gm. in divided doses over the same period.

For children of 9 years or over, a total of 8 Gm. in divided doses over the same period.

For adults, 1.5 to 2 Gm. a day for 5 to 6 days.

The children were given the drug mixed in porridge or cereal on consecutive mornings.

On the basis of 7 consecutive swabs (NIH) taken daily 7 days after the last dose, 76 children and 8 adults were found to be free of infection. The remainder were given a second course

of treatment. Of this group two were not followed, one child remained infected, the rest were found to be free of infection.

No laxatives were given. There were no complaints of adverse effects of the drug.

—*Canadian Pub. Health Jour., 32:6 (June 1941), 308–13*

A NEW MODIFIED CALAMINE LOTION

Dr. George V. Kulchar, M.D., of the Division of Dermatology and Syphilology of the Stamford University School of Medicine, San Francisco, suggests the following formula for a modified calamine lotion:

Prepared Calamine	35 Gm.
Elkonite*	7 Gm.
Zinc Phenolsulfonate	10 Gm.
Glycerin	10 cc.
Aqua Hamamelis	50 cc.
Water, *q. s.*	240 cc.

* Dr. Kulchar uses bentonite with equally satisfactory results.

Dilute the glycerin with an equal quantity of water. Add the calamine in small portions to this solution in a mortar, triturating to a smooth paste between each addition. Sprinkle the bentonite upon 93 cc. of hot water, a little at a time, until the bentonite has all been wetted, allow to cool and triturate in a mortar to remove lumps, and set aside for about 3 hours. Dissolve the zinc phenolsulfonate in 50 cc. of water, add the hammamelis water and dilute the magma with this mixture. Gradually incorporate the diluted magma in the calamine mixture and add sufficient water to make 240 cc.

Dr. Kulchar compares the modified lotion with calamine lotion and states that the modified product has the advantage of greater stability, has less tendency to form gritty particles on the skin and spreads more easily over the surface of the skin. It is easier to remove with water and forms a smooth film not easily removed from the skin by rubbing against clothing.

—*Arch. Derm. & Syphil., 44:1 (July 1941), 43*

SULFANILAMIDE IN GLYCERIN

The application of a supersaturated solution of sulfanilamide in glycerin is routine in the treatment of all cases of impetigo; acute infectious dermatitis of the ears, scalp or feet; coccigenic sycosis; folliculitis, septic ulcers and other streptococcic and staphylococcic infections in his private practice and at the Clinic of the State University of Oklahoma, according to Dr. Everett S. Lain, of Oklahoma City, Okla.

Dr. Lain reasoned that the administration of sulfanilamide internally with the attendant nausea and other side-effects might be avoided in the treatment of non-febrile and obviously localized infections if a solution were used. Sulfanilamide is only slightly soluble in water so Dr. Lain uses glycerin. He mixes 4 to 8 Gm. of the drug with 30 cc. of warm (not hot) glycerin, and he states that the excess sulfanilamide serves as an excellent protective dressing.

The solution is applied with a swab or the finger to the affected areas 2 or 3 times a day without bandaging. The time required for a cure may be shortened if daily applications are made with thin strips of gauze saturated with the solution and bandaged. If sheets of paraffin paper are applied over the saturated gauze under the bandage, the diseased parts will be kept moist and comfortable and the crusts which usually adhere to the gauze will come away with the change of the first dressing. There may be a mild smarting at the first application, due to the action of the glycerin on the area, but this disappears in a few seconds and the dressing becomes soothing and comfortable.

—*Arch. Derm. & Syphil., 44:2 (Aug. 1941), 257*

A NEW INFANT DOSAGE SCHEDULE

Most mathematical formulas or rules for the determination of infant doses are based on the size of the baby in relation to the size of an adult. Although the infant's weight offers a reasonable basis of judgment, it is not always practical to weigh a sick baby and, therefore, most dosage guides are based on the age of the infant.

Between the ages of 1 and 12 years the advances of age and increases in weight are suffi-

ciently parallel to make it possible for a rule to give approximately satisfactory answers but, during the baby's first year growth is not regular. An infant usually gains weight in regular amounts during the first six months after birth, more slowly during the next two months, and still more slowly during the last four months. In all, 9 pounds are usually gained during the first six months and $4^1/_2$ pounds during the second six months.

Differences in the susceptibility of infants to drugs has led to the determination that weight proportions cannot be used completely.

Dr. R. E. Cloud, of Birmingham, Ala., has studied this problem and provided a new dosage guide for infants under one year of age. He uses Bastedo's rule with modifications. Bastedo's rule for the determination of doses for children under 12 years of age, is as follows:

$$\text{Adult Dose} \times \frac{\text{patient's age} + 3}{30}$$

Dr. Cloud modifies this rule for children under one year of age, as follows:

1–6 MONTHS

$$\text{Adult Dose} \times \frac{\text{age} + 5}{100}$$

7–8 MONTHS

$$\text{Adult Dose} \times \frac{\text{age} + 4}{100}$$

9–10 MONTHS

$$\text{Adult Dose} \times \frac{\text{age} + 3}{100}$$

Complete dosage charts, indicating the percentage of the adult dose which should be given, are provided by Dr. Cloud as follows:

Where the physician feels that his infant patient may have a youthful susceptibility to the drug he wishes to administer (idiosyncrasy or allergy in the individual is not referred to), Dr. Cloud takes into consideration the following suggested tolerance percentage of infants:

At birth — 50 per cent of weight proportion or of the fractional doses in preceding tables
7 months— 60 per cent of weight proportion or of the fractional doses in preceding tables
1 year — 70 per cent of weight proportion or of the fractional doses in preceding tables
2 years — 80 per cent of weight proportion or of the fractional doses in preceding tables
3 years — 90 per cent of weight proportion or of the fractional doses in preceding tables
4 years —100 per cent of weight proportion or of the fractional doses in preceding tables

An interesting sidelight on Dr. Cloud's dosage table for infants under 1 year, is the fact that any dose multiplied by 150 gives the approximate weight for a baby of the age specified.

—*Jour. Med. Assoc. St. of Ala., 11:3 (Sept. 1941), 102*

Note: In a personal communication to THIS JOURNAL, Dr. Cloud makes this further explanation of his table: "If we let "*X*" represent the factor in the numerator added to the age, it will be noted that in decreasing "*X*" by one after 6 months and again after 8 months, the doses at *6 and 7* and again at *8 and 9* are the same. More accurate fractions could be obtained by making the steps more gradual, say to have "*X*" = $4^1/_2$ at 7 months, 4 at 8 months, $3^1/_2$ at 9 months, $2^3/_4$ at 10 months and 2 at 11 months. But, after all, only an approximation is important and to complicate a rule to such an extent would seriously interfere with its usefulness."

While the point was not made in my published paper, the dosage at *birth* may be obtained thus:

$$\frac{\text{Age } 0 + 5}{100} = {}^1/_{20} \text{ of adult dose}$$

INFANTS UNDER 1 YEAR

Months	Birth	1	2	3	4	5	6	7	8	9	10
	1/20	1/17	1/14	1/12	1/11	1/10	1/9	1/9	1/8−	1/8	1/8+

CHILDREN 1 YEAR AND OVER

(*Bastedo Rule*)

Year	1	2	3	4	5	6	7	8	9	10	11	12
	1/7−	1/6	1/5	1/4−	1/4+	1/3−	1/3	1/3+	2/5	2/5+	1/2−	1/2

SULFAPYRIDINE DOSAGE IN CHILDHOOD PNEUMONIAS

Children above the age of two years, where the prognosis, particularly in lobar pneumonia, is known to be good, require less sulfapyridine than children under that age, according to Drs. S. L. Ellenberg and H. S. Altman, of the Pediatric Service of Lincoln Hospital, New York City.

A dosage schedule of 0.1 Gm. per Kg. of body weight for the child over two will produce the desired effect of assuring a good prognosis, a prompt subsidence in temperature and in the toxicity of the pneumonia process, and will be accompanied by a lower incidence of toxic manifestation.

For children under the age of two years it is best to use a higher dosage schedule, 0.2 Gm. per Kg. of body weight, in treating pneumonias, particularly bronchopneumonias where the streptococcus is the responsible organism. Prognosis is far more serious in children of this age group and their response to sulfapyridine is less favorable.

At Lincoln Hospital, 107 pneumonia patients in the nursery and pediatric ward from December 19, 1938, to October 31, 1939, were given 0.2 Gm. of sulfapyridine per Kg. of body weight per day, and 113 patients from November 1, 1939, to June 19, 1940, were given half that amount. For the first twenty-four hours the daily amount was divided into equal doses given at four-hour intervals with the initial dose being twice as large as the succeeding ones. On the following day the same dose was given three times a day and continued three times a day until the patient's temperature remained normal for twenty-four hours. The drug was then discontinued.

Children over two years of age, on the smaller dosage, showed an adequate therapeutic response, less incidence of drug fever, a smaller number of genito-urinary complications, slightly lessened incidence of rashes and less nausea. In addition, patients on the lower dosage had less need for additional therapeutic measures such as oxygen, transfusions, clysis, sedation, serum and methods to combat abdominal distention.

The pediatricians found that the response of bronchopneumonias to sulfapyridine in any dosage was distinctly less favorable than that of lobar pneumonia because the majority of bronchopneumonias had streptococcus as the responsible organism. For these cases the higher dosage schedule is recommended.

For children under two years of age, it is suggested that the administration of sulfapyridine be continued until the patient's temperature remains normal for two or three days, rather than for merely twenty-four hours. The temperature of children in this younger age group shows a tendency to rise after the twenty-four hour period.

—*Arch. Pediatrics, 58:10 (Oct. 1941), 649–656*

SULFATHIAZOLE IN TREATMENT OF BED SORES

Decubitus ulcers, commonly known as bed sores, are extremely resistant to treatment. At the Cuyahoga County Nursing Home, Cleveland, Drs. J. I. Goodman and J. F. Corsaro were confronted with five cases of many months' standing on which all methods of treatment had been unsuccessful.

The physicians decided to try sulfathiazole. The drug was finely powdered and applied with a salt shaker or blower in sufficient quantity to form a complete coating over the ulcer. Finely powdered tablets are preferred to the drug in powder form. The results were "magical," they report. Immediately after the application of the drug the infections began to clear up; clean, healthy granulation tissue appeared; and the ulcers healed up rapidly.

—*Ohio St. Med. Jour., 37: 10 (Oct. 1941), 956–958*

GLOBIN INSULIN

The aim of the physician in the treatment of diabetes mellitus is to give one injection of insulin which, in conjunction with an adequate diet, will maintain the level of blood sugar within normal limits for twenty-four hours. This is not possible with the many patients, using the preparations of insulin now available. Unmodified or crystalline insulin begins its action quickly and its effect is soon ended; protamine zinc insulin is delayed in action and is prolonged in effect; but physicians desire a preparation which would come in between these two products.

Drs. G. G. Duncan and C. E. Barnes, of the Pennsylvania Hospital, Philadelphia, report in-

teresting results with a new combination of globin, zinc and insulin which begins its action shortly after injection, gradually increases in effect to between the eight and twelfth after injection, and then gradually subsides in eighteen to twenty-four hours after administration. They have compared its effect on 42 patients and report that the new combination has quantitatively greater effect, unit for unit, than protamine zinc insulin.

The globin is prepared from beef blood by removing the iron-containing fraction from the hemoglobin molecule. It is a simple protein which is soluble at its iso-electric point.

The preparation was provided by the Experimental Research Laboratories of the Burroughs Wellcome Company. Its composition is as follows:

Globin	3.04 mg.
Zinc	0.24 mg.
Insulin	80 units

It is a clear, yellowish fluid with a pH of 3.7.
—*Am. Jour. Med. Sci., 202: 4 (Oct. 1941), 553–563*

URGES PILLOW FOR INFANTS

Pharmacists who have developed baby departments and who make a point of being able to offer competent advice on the many questions that are asked by mothers concerning baby care, will be interested in a recent article by Dr. Louis Palmer, of the Department of Medicine, Jewish Hospital, Brooklyn, N. Y., on the subject of pillows for infants.

Because his own three-month-old daughter was almost asphyxiated as a result of the aspiration of thick mucous, Dr. Palmer makes a strong case in favor of the use of a pillow which will give aid by gravity to passage down the esophagus and prevent similar cases of aspiration asphyxia. A firm hair pillow, not a soft downy one, is recommended by Dr. Palmer.

No infant should be fed on its back nor should be put in this position immediately after feeding because of the possibility of regurgitation and subsequent aspiration of some of the material.
—*Arch. Pediatrics, 58: 10 (Oct. 1941), 666–668*

DIGITALIS POTENCY AND ASSAY TO BE CHANGED

Tincture of Digitalis, U. S. P. XII, will be weaker than Tincture of Digitalis, U. S. P. XI, but stronger than Tincture of Digitalis, U. S. P. X, and will be assayed on cats instead of frogs, according to Dr. Erwin E. Nelson, of the Department of Pharmacology, Tulane University of Louisiana School of Medicine, and Chairman of the Subcommittee on Biological Assays of the U. S. P. XII Revision Committee (*Jour. A. M. A.*, 117:24 (Dec. 13, 1941), 2093).

Dr. Nelson points out that the increase in potency of digitalis preparations in the last U. S. P. was intended to bring American preparations into line with those of countries accepting the League of Nations Standards. One U. S. P. Digitalis Unit was to equal one International Digitalis Unit, and Tincture of Digitalis was required to possess one U. S. P. Unit per cc. Bringing American preparations into line with the International Standard necessitated increasing their potency from 25 to 30 per cent above that of the U. S. P. X preparations. When the U. S. P. Revision Committee prepared a Reference Standard Digitalis Powder, against which manufacturers could assay their digitalis preparations, it was found to be somewhat stronger than the International Reference Powder so that 0.745 Gm. of the U. S. P. Reference Powder was taken to possess the potency of 1 Gm. of the original International Reference Powder.

There has been widespread disagreement with the 0.745 factor, many believing that the U. S. P. Reference Powder is even stronger and that preparations assayed against it were as much as 150 per cent of the potency of U. S. P. X preparations—that is, 50 per cent stronger.

Dr. Nelson has served as chairman of a collaborative study on the subject and a new U. S. P. Reference Powder has been developed and has been adjusted to the potency of the International Reference Powder. It is expected that the U. S. P. XII preparations will have the potency that U. S. P. XI preparations were intended to have, namely, 125 per cent of the strength of U. S. P. X preparations.

Most of the clinical studies of digitalis dosage in the literature were made before 1936 and were based on preparations of U. S. P. X potency. Most physicians are accustomed to that strength preparation and many do not understand the change which was made in 1936 in the U. S. P. XI.

THREE TYPES OF INCOMPATIBILITIES OF SUSPENSOIDS

by JOSEPH B. SPROWLS

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PRESCRIPTIONS FOR SUCH PRODUCTS AS AMPHOJEL, AND KAOMAGMA, ETC., IN COMBINATION WITH SALTS OF BISMUTH AND OTHER SUBSTANCES OR WITH EACH OTHER OFTEN GIVE TROUBLE

A NUMBER of magmas and other closely related preparations, which can be collectively described as "suspensoids," are being prescribed rather frequently in combination with other preparations of the same type with which they appear to be incompatible. These suspensoids contain hydroxides, carbonates and silicates in an extremely fine state of subdivision. There seems to be a tendency on the part of physicians to prescribe combinations of suspensoids; therefore this paper is concerned primarily with the mutual incompatibilities of these preparations.

One of the prescriptions representing an incompatibility which has been encountered by the author is the following:

℞

Bi Subnitratis	℥ii
Kaopectate, *q. s.*	℥ii

This was observed to become thick when the ingredients were mixed and to form a rather solid mass on standing.

Two other prescriptions which formed semisolid, gel-like masses within a few hours of compounding are these:

℞

Kaomagma, Milk of Magnesia, *aa*	℥ii

℞

Kaopectate, Cremo-Carbonates, *aa*	℥ii

Probably prescriptions calling for such incompatible ingredients as these result from the physicians' thinking in terms of desirable therapeutic effects rather than in terms of possible pharmaceutical incongruities. However, the very fact that these suspensoids are more or less colloidal in nature would lead one to suspect that the number of materials with which they can be combined is limited and that their indiscriminate use as adjuvants is not advisable.

The intent of this investigation by the writer was to study more thoroughly the incompatibilities (particularly the mutual incompatibilities) of the suspensoids so that some knowledge of their limitations might be gained. A complete list of the preparations studied is as follows: Amphojel (Wyeth), Kaomagma (Wyeth), Kaomagma with Mineral Oil (Wyeth),* Kaopectate (Upjohn), Cremo-Carbonates (Sharp and Dohme), Milk of Trinesium (Abbott), Haley's M-O (Phillips),* Milk of Bismuth and Milk of Magnesia.

One fluidounce of each of the preparations was mixed with an equal volume of each of the others. Each of the first seven preparations was also combined with Bismuth Subcarbonate and Bismuth Subnitrate in such amounts that each fluidram of the combination contained 7½ grains of the bismuth salt. The mixtures were maintained at room temperature in stoppered wide-mouth bottles and were shaken thoroughly after each examination had been made. They were examined every two hours during the first eight hours and thereafter at 24-hour intervals for one week.

GEL-LIKE MASS FORMED

It is obviously impractical to give a complete description of the many changes which were observed; however, an attempt will be made to summarize the more important information. The most significant change noticed was coagu-

* These preparations could be described as "emulsoid suspensoids."

lation of the dispersed material to form gel-like masses from which a watery fluid separated. This precipitate disintegrated, upon shaking, into rather granular clumps, but it could not be redispersed throughout the mixture. There was complete destruction of the colloidal nature. Combinations which reacted in such a way are presented in the following table, which shows also the number of hours which were required for the coagulation to occur.

Combinations	Number of Hours
Kaomagma plus Kaopectate	24
*Kaomagma plus Bi Subcarbonate	12
Kaopectate plus Milk of Magnesia	24
Kaopectate plus Haley's M-O	24
Kaopectate plus Bi Subnitrate	4

THICKENING OF PREPARATIONS

A second incompatibility which was observed more frequently was a thickening of the preparation until it became too thick to pour even from a wide-mouth bottle. In some combinations this thickening was immediate, while in others the thickening occurred gradually, requiring several days to reach a condition in which it could not be poured. In most instances these preparations became increasingly thick upon standing until ultimately there resulted a semi-solid or a solid mass. Combinations which thicken in this fashion, together with the number of hours required to become so thick that they could not be poured, are the following:

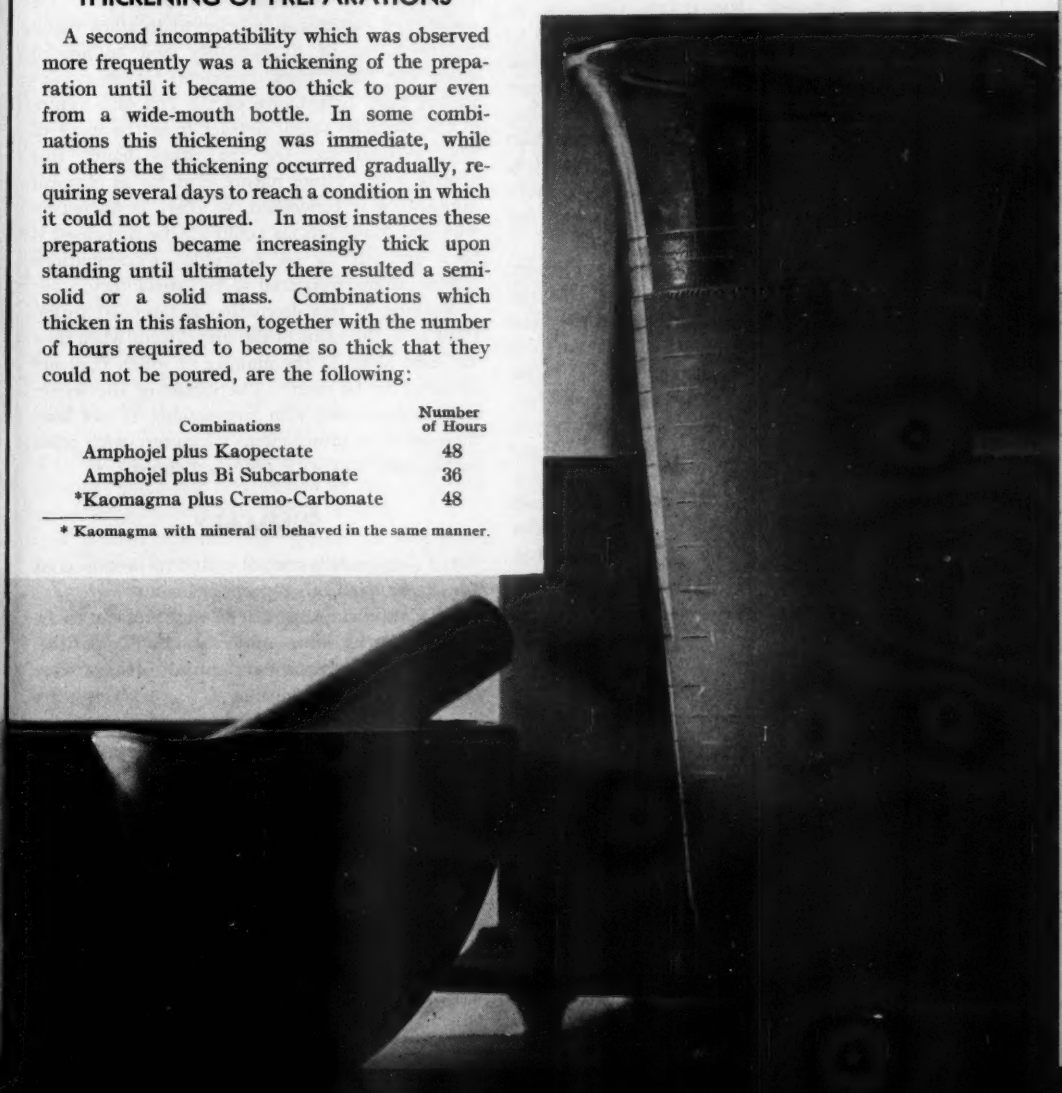
Combinations	Number of Hours
Amphojel plus Kaopectate	48
Amphojel plus Bi Subcarbonate	36
*Kaomagma plus Cremo-Carbonate	48
*Kaomagma plus Haley's M-O	96
*Kaomagma plus Milk of Magnesia	96
Kaopectate plus Cremo-Carbonates	4

* Kaomagma with mineral oil behaved in the same manner.

GRANULAR PRECIPITATE

A third type of incompatibility which was observed in some cases was a flocculation which resulted in the deposition of a rather granular precipitate. Though the precipitate could be easily redispersed by shaking, it settled out rather rapidly. A list of combinations which reacted in this way will follow.

Amphojel plus Cremo-Carbonates
Kaomagma plus Kaopectate
Kaomagma plus Bi Subnitrate



Cremo-Carbonates plus Milk of Bismuth
Cremo-Carbonates plus Bi Subnitrate
Haley's M-O plus Bi Subcarbonate

COLLOIDAL REACTIONS

The changes observed seemed to be brought about through typically colloidal reactions. For example, the precipitation of the suspended material in Kaopectate by the addition of Milk of Magnesia took place in a manner which suggested the mutual precipitation of colloids of unlike charge. Indeed, a sample of Kaopectate made alkaline with KOH coagulated almost immediately. In a similar fashion, Kaomagma, which forms a semi-solid mass with Kaopectate, was found to be coagulated by HCl. Since kaolin constitutes the bulk of the suspended material in both these preparations, the reactions just described may appear to constitute an anomaly. However, Kaopectate contains, as a protective colloid, pectin, which is known to be precipitated by positive ions (1); while Kaomagma contains no such vegetable substance (2), but does contain colloidal aluminum hydroxide. Many examples of typical flocculation were observed, and the almost immediate coagulation of Kaopectate by bismuth subnitrate may have been brought about through the well-known ion effect on colloids.

These observations seem to emphasize the very obvious fact that the incompatibilities of the suspensoids embrace not only the usual chemical and physical rules of incompatibility, but also the rules of colloidal incompatibility. This has been pointed out in regard to Magma of Magnesia (3). In dealing with such suspensions one must bear in mind that oppositely charged colloidal particles are capable of mutual precipitation. Thus, even though two magmas or other suspensoids may seem to be very similar in nature and thus appear to be compatible, they may be incompatible because of their being colloids of opposite charge.

In considering the significance of these changes which have been observed, we must give some consideration to the use for which such prescriptions might be intended. It is obvious that such combinations would be almost certainly intended for the treatment of acute gastro-intestinal disturbances such, for example, as the common "summer complaint," hence they would probably not need to be very permanent in nature. Providing the prescription would be usable for a period of two or three days, it would in most instances survive the need of medication. Those combinations in the second group which do not become too thick to pour within three days are probably satisfactory for dispensing. Nevertheless, the physician should keep in mind that such preparations are not permanent and should prescribe them in small amounts, while the pharmacist should dispense such combinations only in wide-mouth containers.

Preparations which form gel-like masses, as those in the first group, would seem to be very unsatisfactory for use.

The third group of combinations showed a decided tendency to form a granular precipitate. The incompatibility of such combinations is perhaps more theoretical than actual. It is generally believed that a part of the value of the preparations studied depends upon the degree of fineness of the suspended particles. This fineness of suspension is believed to allow ready neutralization of hyperacidity and to adsorb gases and other toxic products. It seems apparent that disturbance of the colloidal nature of the particles might detract from the value of the preparations. On the other hand, this change is of a minor nature in so far as physical appearance is concerned, so there is no reason why the combinations could not be dispensed if they are felt to be desirable. Combinations not mentioned appeared to be satisfactory.

Nothing in this discussion is intended to detract from the value of the suspensoids when they are used alone in the manner in which they are intended to be used. The intent of the writer is to demonstrate that suspensoids do not lend themselves to promiscuous admixture with other suspensoids and with other substances.

SUMMARY

1. Suspensoids are not suited to promiscuous admixture with other preparations.

2. Colloidal preparations may appear to be very similar in nature and mutually compatible; yet if they bear particles of opposite charge, they are mutually incompatible.

3. If it is necessary that prescriptions be written for combinations of suspensoids, only small amounts should be prescribed and these must be dispensed in wide-mouth containers.

(1) Husa, William J., "Pharmaceutical Dispensing," 2nd Edition, page 533.
(2) Hunsberger, Ambrose, Jr., Private communication.
(3) LaWall, Wood, "United States Dispensatory," 22nd Edition, page 655.

Bentonite Base

FIFTEEN PER CENT SUSPENSION OF COLLOIDAL CLAY DEVELOPED FOR USE IN THE TREATMENT OF VARIOUS SKIN CONDITIONS OF SCALP OR ANORECTAL REGION

A FIFTEEN per cent suspension of Bentonite in water makes an ointment base which forms a dry film on the skin in two to three minutes and is firmly adherent, does not rub off on the clothing, but is easily removed by gentle washing with water, according to Dr. George V. Kulchar, of the Division of Dermatology and Syphilology, Department of Medicine, Stanford University, San Francisco. The colloidal clay base, published in *Archives of Dermatology and Syphilology* for July 1941 (44:1, 43), was made with the use of Elkonite, a natural clay obtained near Elko, Nevada, but in a personal communication to this JOURNAL, Dr. Kulchar states that difficulties in obtaining this clay have led him to use Bentonite and it has given equally satisfactory results.

Bentonite base is particularly well suited for use in the treatment of eruptions and pruritis of the anogenital region. This area is always clothed and it is difficult to keep medication in place and prevent its removal by clothing. The dry film formed by the new base eliminates that problem and keeps medication *in situ*, affording relief for a considerable period of time.

A second outstanding quality of Bentonite base is the fact that it does not spread to the hair when applied to the scalp. Thus it overcomes a disagreeable feature of most ointments. Treatment of skin conditions is cleaner and less of an ordeal, particularly if coal tar or dyes are used as the medication, for these substances are ordinarily disagreeable in the usual bases.

Patch tests on a series of normal persons have given negative reactions, indicating that Bentonite is not primarily irritating to the skin.

Bentonite base has been used for salicylic acid, ichthammal, ammoniated mercury, resorcinal, sulfur, naftalan, coal tar, peruvian balsam, gentian violet and juniper tar, alone and in combinations. No incompatibilities have been observed.

The concentrations and combinations of medicaments used are the same as ordinarily employed in ointments.

Ointments made with Bentonite base maintain their consistency longer than three months despite changes in temperature, if evaporation is prevented.

The usual method of making Bentonite suspensions by sprinkling the clay on the surface of water a little at a time and allowing it to swell and form a gel is unsuitable for concentrations above 7 or 8 per cent. To make a 15 per cent suspension, add the Bentonite to the water under constant agitation with a mechanical mixer or use a mortar and pestle until it absorbs the water and then rub it up on a slab with a wide spatula until a smooth, homogeneous mixture is obtained. The finished base has a consistency of library paste.

Here is an easily prepared ointment base which pharmacists can suggest to physicians for use in the treatment of dermatological conditions of the scalp or the anorectal region. If dermatologists in your community have read Dr. Kulchar's paper in *Archives of Dermatology and Syphilology*, and inquire concerning Elkonite, advise them that Dr. Kulchar is now using Bentonite with satisfactory results.

Peter Paul Rubens' portrait of Paracelsus which hangs in the Museum of Brussels. Photo from the Bettmann Archive.

PARACELSUS—AFTER 400 YEARS

by CURT P. WIMMER

COLLEGE OF PHARMACY OF THE CITY OF NEW YORK, COLUMBIA UNIVERSITY

HATED AND REVILED IN HIS DAY BY PHYSICIANS AND PHARMACISTS ALIKE, HE IS HONORED TO-DAY AS A MEDICAL AND PHARMACEUTICAL GENIUS WHO GAVE A NEW OUTLOOK AND DIRECTION TO BOTH CALLINGS

AUREOLUS Philippus Paracelsus Theophrastus Bombastus of Hohenheim was born in 1493 at Einsiedeln, Switzerland. His father, Wilhelm Bombastus of Hohenheim, was a physician, and at the time of Paracelsus' birth held a seat in the Agricultural Institute at Stuttgart. His mother was formerly a matron in the hospital of the Einsiedeln nunnery. In the year 1502 his parents moved to a village in Karnthen where his father, up to the year 1534, was active as a distinguished physician.

Paracelsus, an only child, had his education begun early by his father who tutored him in the various arts and sciences, and who made certain that great stress was placed upon his religious training. When he was 16 years old he entered the University of Basel, and it was here through the teachings of the famous Abbot von Sponheim, Johann Trithemius, that he became a brilliant chemist. He utilized his knowledge by working unceasingly in the laboratory of the

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wealthy Siegmund Fugger who lived in Switzerland.

His great thirst for knowledge drove him very early in life to travel through various parts of Europe. In his travels he acquired from the various famous universities a tremendous knowledge of metallurgy, natural history and medicine, and from the people themselves a great deal of useful information.

After an absence of ten years Paracelsus returned to Germany, and it was in 1527 that, partly due to his fame as a skilled physician, and partly due to the recommendation of his distinguished friend, Oecolampadius (Hausschein) von Weinsberg, he was offered a professorship at the University of Basel. He combined at the same time his teachings with that of a practicing physician.

Paracelsus astounded the university and his contemporaries not only by delivering his lectures in German (the lectures were originally given in Latin), but by burning publicly the works of Avicenna and delivering a vehement talk on all the unhappiness contained in those so-called great books.

Despite his amazing cures and his fame as a brilliant physician, Paracelsus continued to make enemies through his criticism of the apothecaries and doctors, who, he said, were in league with one another for the purpose of robbing their patients.

The climaxing reason for Paracelsus' leaving Basel was due to a violent quarrel with Canon Cornelius von Lichtenfels. Paracelsus had attended him in his illness, and at the Canon's being cured, Paracelsus did not receive the fee agreed upon by both of them. The matter was taken to court, and instead of Paracelsus getting the stipulated amount of 100 gold pieces, he received 6.

In consequence of this unfortunate situation, Paracelsus betook himself to Esslingen at Stuttgart where his family had recently purchased a house (that house still stands). It was here that he found shelter for a while, but the yearning for further knowledge burned deeply in him, and he continued his extensive travels.

In the year 1529 he was in Colmar, Beritzhausen and Nurnberg; in 1535 in Bad Pfaffers in Switzerland; in 1536 in Munchroth and Augsburg; in 1537 at Kromnau, Moravia and Vienna; and in 1538 at St. Veit in Karnthen, Augsburg and Meran. Finally, in 1540, he found a haven in the village of Salzburg where the Duke Ernst of Bavaria gave to him what he needed most at the time, friendship. Here at Salzburg, Paracelsus became ill in September 1541, and died shortly after on the 24th of the same month, 48 years old. His death at such a height in his startling career was probably due to uninterrupted, excessive, abnormal living. His body could not keep up with the terrific pace he had set for himself.

Paracelsus was buried in the churchyard of Bruderhause at Salzburg, and in the year 1572 his remains were taken and placed in the entrance hall of the church.

PARACELSUS' CHARACTER

As every student of history knows, violent quarrels which in intensity exceeded any that we might have now-a-days, were of an almost daily occurrence between the scientific men of former periods. This may be readily understood when we remember that there existed no means to prove one's point by an experiment that might convince the opponent: that the only way to counter the opponent was to talk louder, praise one's knowledge more, and retaliate the calling of names by calling more and stronger names.

Paracelsus was no exception in this respect. He was a reformer, a man of genius, an outstanding physician, making use of new and daring methods to cure the sick. All of this was sufficient to make him a target for violent attacks by his colleagues: an object of jealousy and persecution. On the other hand, Paracelsus had many adherents who praised him highly and followed his teachings blindly; men such as Andreas Libavius, Oswald Croll, Adrian Von Mynsicht, Quercetanus and the famed Turquet de Mayerne.

In his innermost being, Paracelsus was a man honest and true; endowed with a very good opinion of his own greatness and knowledge. True, in this belief in his own greatness he often went beyond the limits of what we would call gentlemanly behavior and manners, but this may be attributed to his education, his roaming life and his unfavorable position in his later years. He says of himself: "My own manner suits me perfectly. But that you may understand my peculiar ways, please note that by nature I am not finely made; nor is it my country's manner to get things by means of silken threads. We were not educated with sweet things, nor with honey or white bread, but with cheese, milk and black bread. Such things do not make fine fellows."

Numerous, indeed, are statements in his genuine writings, which prove that he was a character of sterling qualities, of deep religious convictions and sincere enthusiasm for the well-being of humanity. Bitter enemies of his never dared to deny these virtues in him. The claims of his opponents to the effect that he lacked real education, that he was grossly superstitious, that he had a strong tendency to mysticism, theosophy and astrology, are quite unjustified. Whatever little of these faults was in his make-up, he shared with the most excellent men of his time. The only real failing in him was that he at times used alcoholic drink excessively, but even here his two chief accusers, Oporinus and Erastus, were fanatics whose testimony is not without bias.

Paracelsus was a tireless, intensive worker. His writings were edited and published in ten volumes by Huser, in 1589. In addition, Paracelsus laid down his chemical and pharmaceutical knowledge in the following publications: "Archidoza;" "De Tinctura Physicorum;" "Tracts on Natural Things, Herbs, Metals and Precious Stones."

His entire life was spent in trying to reform and change the practices then prevailing in medicine and pharmacy. He knew well that his was a voice crying in the wilderness, but that did not deter him from calling a spade a spade and from lashing out in violent language against physicians and pharmacists alike. He said: "In the apothecary's wooden boxes and containers is nothing but quackery and as these containers are, so are the doctors and apothecaries; for like and like go together. It has happened to me that the apothecaries, by their great ignorance, have used substitutes and, in addition, have demanded exorbitant prices or high praises. They praise their medicines so highly, that I cannot believe that cleverer liars can be found. They are false and betray the doctors; they lead them by the nose. If they say, 'that is so,' the doctor answers 'yes, my dear Mr. Apothecary.' And so, one fools the other one. God help the sick if they fall into such hands."

No wonder that his colleagues replied with names such as "cacofrastus" (diseased maniac) or "stubborn mule" and other choice terms.

But he went his way unafraid and stated: "I know that I please no one except the sick whom I heal."

On another occasion, he states: "It is the physicians' business to cure the sick, not to enrich the apothecaries. They are my enemies because I will not empty their boxes. My recipes are simple and do not call for forty or fifty ingredients."

PARACELSUS THE PHARMACIST

Nothing that may be said about Paracelsus as a pharmacist can detract from the fact that he was a physician first and foremost who aroused admiration and wonder because of his many miraculous cures of diseases which other famous doctors of his time had dispaired of. But it was customary in his day for many physicians to prepare their own medicines, while others had them prepared by the pharmacists, usually supervising the preparation. But Paracelsus had unfortunate experiences with some of the pharmacists' preparations; also, he was what we would term a research pharmacist-physician who blazed new trails in therapeutics—he had to prepare most of his remedies himself.

Condensing the statement of the merits of this genius, we may say the following:

1. Paracelsus broke with a tradition in medicine of thousands of years which tied the hands of every physician to the methods and dictates of writers, who had lived and worked a thousand years before that time, such as Galen, Avicenna and others. How strong this tradition was is shown by a remark made by a famous professor of medicine in the University of Padua, who said: "I would rather be wrong with Galen in treating the sick than right with Paracelsus."

2. Paracelsus immensely enriched the materia medica by the introduction of metallic remedies for internal use; moreover, he defended his belief that poisons when used internally under proper precautions and proper dosage are useful remedies—no one had dared to do this before him.

3. He condemned, fiercely, the pharmacists for using numerous ingredients in their medicines, some of them containing forty or fifty and upward components. Paracelsus called for simplicity in pharmaceutical preparations.

4. He insisted upon the use of native herbs, claiming that God had provided a remedy for every disease in the same country where the disease was found.

While these are merits of great importance, we must not forget that Paracelsus was a man of

his time subject to many bizarre beliefs that seem most strange to us. To the debit side of his evaluation must be placed his revival of the belief in the so-called Doctrine of the Signatures, his proposition of the *Unguentum Sympatheticum* and of the *Arcanas*.

The Doctrine of the Signatures was not new; it had its origin in very olden times, but it had been forgotten. Out of his deep religious conviction, Paracelsus revived it and for nearly 200 years after his time, it played a part in medicine.

It was the firm belief of the medical men of the 16th and 17th centuries that the plant world contained all of the remedies needed to cure the ills of mankind; nearly every plant known to the naturalists of that time was credited with some therapeutic action. The difficulty was to determine which plant was suitable in a given case; true there were data obtained by experience, but they were more or less unreliable and uncertain. It appeared quite logical to assume that a medicine composed of many ingredients might be more apt to effect a cure than one consisting of few.

Paracelsus did not accept this point of view. His religious mind wished that somehow God would not fail to indicate the proper use of plants to mankind, and so he revived and advocated the view that any striking characteristic of a plant indicated its use as a medicine, *viz.*, the walnut, on account of its convolutions, for brain disorders; red flowers for blood disorders; yellow ones, such as turmeric, rhubarb, saffron, in jaundice and biliousness; euphrasia for eye diseases because the black spot in the flower resembles the pupil of an eye, and so forth. This was the Paracelsus "Doctrine of the Signatures."

In common with all medical men of his day, the views and ideas of Paracelsus as to the nature and the causes of diseases consisted of a mixture of weird beliefs. He accepted the views of Basil Valentine to the effect that the human body requires for well-being a careful balance of mercury, sulfur and salt. Should the sulfur increase in quantity, fever and plague would result, while an overbalance of mercury or salt would be followed by paralysis or dropsy. External diseases were manifestations of internal disorders caused by a spiritual effect; disease according to him was not physical but spiritual, and a remedy had to be used which was antagonistic not to the disease in a physical sense, but to the spiritual seat of the disease. Such remedies he termed "Arcana" and prepared them by extracting plants with water, alcohol or acids; or he would pound plants to a pulp and let the mixture ferment, and use the juice either as such or after distillation.

From his belief in the spiritual element came his "Sympathetic Remedy," the so-called "*Unguentum Armarum*," an ointment consisting of powdered burnt earth worms, dried boar's brain, red sandalwood, mummy, blood stone, one ounce each, with one dram of powdered moss from the skull of a man who had been hanged and not buried. With these he made an ointment with four ounces each of boar's and bear fat, purified by heating the fats and pouring them into cold water. This ointment was not applied to a wound, but upon the weapon which had caused it. The wound was simply washed with cold water and bandaged with clean linen. It was assumed that a certain magnetic current was created, acting from the anointed weapon which acted upon the wound and caused it to heal. On other occasions, Paracelsus applied the leaves of *Polygonum persicaria* to sores and ulcers, then these leaves were buried in the expectation that these leaves would attract the evil spirits like a magnet, drawing these spirits from the patient to the earth.

With the creation of the *Arcanas* Paracelsus laid the foundation for a traffic in secret remedies—he did not disdain to keep the composition of some of his remedies secret. This practice was later thoroughly exploited by his followers, some of whom sold their secret remedies at outrageously high prices. It was the beginning of the nostrum era.

From a pharmaceutical point of view, Paracelsus blazed new trails. He prepared new chemicals and used them internally; for example, mercury had been used only externally for syphilis. Paracelsus fused mercury with nitric acid, or nitrites, and obtained the red precipitate which he made into pills with theriac and honey, as a purgative. Similarly he prepared arsenates and antimonates, the former for external uses only. He distilled spirit of wine and re-distilled it. A compound of gold and mercuric chloride was his Elixir of Long Life. He had great faith in the products of distillation of vitriol and alcohol, his "oyle of wine." He examined mineral waters and used a tincture of nutgall to show the presence or absence of iron in it; numerous additional experiments along what we would term chemo-

therapeutics might be recited, but let us proceed to strictly pharmaceutical preparations made by Paracelsus.

We have already mentioned that in making pills, he used theriac as a diluent and honey or cherry juice as excipient; on another occasion he made a pill of a solution of mercury, aloes, myrrh and saffron with an oyle of staphisagria as excipient. He prepared powders, such as a mixture of finely powdered marcasite (an iron pyrite), powdered coral and plantain seed as a hemostate; he used mixtures of equal parts of talcum and bean starch as an absorbent for wounds and ulcers; calamine in eye salves and for ulcers, made into a plaster "where a growth of fresh flesh is required." He prepared troches using mucilage of acacia and mint or plantain water; for ointments he used the fat of foxes, the grease of a red hog, bear's fat or oil of almonds as bases; for masses and pastes, he employed tragacanth, psyllium, foenugreek, and acacia or mucilages. All of his formulas show that he was thoroughly familiar with good pharmaceutical practices which, indeed, were not so very different, fundamentally at least, from our own. His prescriptions were simple; rarely did they contain more than three or four ingredients, and there was considerably more thought and logic for the efficiency and curative effects than in those of any of his contemporaries.

It is not possible within the limitations of time and space devoted to this subject to describe the numerous remedies which this man created, such as his *Essentia Mercurialis*, his Quintessences, his Laudanum, his *Oleum Philosophorum*, his *Tinctura Metallorum*, his *Confectio Anti-Epileptica*, his Balsam of Wounds, his organo-therapeutic remedies, and so on and on.

When Paracelsus died at the early age of 48 years, he was a man broken in mind and body; the amount of work that he had done was tremendous, the persecutions he had to endure from his colleagues in medicine were great; at times he lived in affluent circumstances only to be thrown quickly into abject poverty and starvation. He left to the world many publications. Those of pharmaceutical interest are:

"Archidoxa de Quinta Essentia"
"De Arcanis"
"De Elixiriis"
"De Thermis"
"Declaration to Prepare Hellabore"
"Methodus Pharmacandi"

On a marble monument erected to him at Salzburg is this inscription:

"Conditur hic Philipus Theophrastus, insignis Medicinae Doctor, qui dira illa vulnera, lepram, pogagram, hydroposim, aliaque insanabilia contagia mirificu arte sustulit; ac bone sua in pauperes distribuenda collocandaque honoravit. Anno 1541, die Septembre 24, vitam cum morte mutavit."

(Here lies Philipus Theophrastus, the famous Doctor of Medicine, who by his wonderful art cured the worst diseases, wounds, leprosy, gout, dropsy and other diseases deemed incurable and to his honor shared his possessions with the poor.)

On this occasion, the 400th anniversary of his death, let us honor him and express our admiration for this man of unbounded energy and courage; an outstanding and astonishing medical and pharmaceutical genius and reformer; a revolutionary spirit who, as his contemporary Martin Luther gave new ideas and direction in religion, so Paracelsus gave a new outlook and direction in medicine and pharmacy.

"A History of Chemistry," F. P. Armitage.
"A History of Pharmacy," James Grier.
"Chronicles of Pharmacy," Vols. 1 and 2, Wootton.
"Four Thousand Years of Pharmacy," Charles H. LaWall.
"Geschichte der Apotheker," A. Phillippe and Dr. Hermann Ludwig.
"Geschichte der Pharmazie," Hermann Schelenz.
"Hermetic and Alchemical Writings of Paracelsus," A. E. Waite.
"History of Pharmacy," Edward Kremers and George Urdang.
"114 Experiments and Cures of Phillip Theophrastus Paracelsus," Barnard G. Londrada A. Porter Aquitanus.
"Life and Doctrines of Paracelsus," Franz Hartmann.
"Life of Paracelsus," A. M. Stoddart.
"Mystery and Art of Apothecary," C. J. S. Thompson.
"Paracelsus—Greatest of the Alchemists," Franz Hartmann.
"Pictorial History of Ancient Pharmacy and Medicine," Hermann Peters.

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